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MATERIALS TOWARD A MONOGRAPH OF THE GENUS LIPPIA. IX

Harold N. Moldenke

LIPPIA TAYACAJANA Moldenke

Additional bibliography: Moldenke, Phytologia 12: 506. 1966.

Shrub, about 1 m. tall; branches slender, tetragonal, ribbed, densely short-pubescent when young, glabrescent in age and then with peeling shreddy bark, brown, somewhat twiggy below; twigs very short, leafy; nodes not annulate; principal internodes much abbreviated, 1—3 cm. long; leaves decussate-opposite; petioles slender, 1—2 mm. long and densely short-pubescent or obsolete; leaf-blades firmly chartaceous, uniformly gray-green on both surfaces, oblanceolate-elliptic, 0.8—1.9 cm. long, 3—9 mm. wide, rounded or acute at the apex, cuneate-attenuate at the base, revolute along the margins and serrate from about the middle to the apex, scabrous and substrigose above, densely tomentellous beneath; midrib and the slender secondaries deeply impressed above, very prominent beneath; inflorescence axillary, solitary in each axil, 1—1.5 cm. long, capitate, rather few- or submany-flowered; peduncles very slender or filiform, 10—12 mm. long, densely appressed-pubescent with antrorse canescent or yellowish hairs; heads small, about 5 mm. long and wide; bractlets lanceolate, about 4 mm. long and 1.5 mm. wide, sharply acute at the apex, densely appressed-strigose-pubescent; corolla hypocrateriform, white, about 5 mm. long, its limb about 2 mm. wide.

The type of this species was collected by August Weberbauer (no. 6510) in the valley of the Mantaro, northeast of Pampas, in the province of Tayacaja, Huancavelica, Peru, at an altitude of 1800—1900 meters, in March, 1913, and is deposited in the United States National Herbarium at Washington. The species is obviously closely related to L. ferruginea H.B.K. It has been found growing on dry slopes at an altitude of 1450 to 1900 meters, flowering in March and June. A vernacular name recorded for it is "limoncillo". The Asher, Kates, & Cia. 17987, cited below, is placed here tentatively because of its fragmentary nature.

In all, 4 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: PERU: Huancavelica: Weberbauer 6510 (N—isotype, N—photo of type, W—1495440—type, Z—photo of type). La Libertad: López Miranda & Sagástegui 3358 (Z). Department undetermined: Asher, Kates, & Cia. 17987 (Kr).

LIPPIA TEGULIFERA Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 309—310. 1904.

Synonymy: Lippia tegulifera var. parvifolia Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 310. 1904. Lippia tegulifera var. tegulifera [Troncoso], Darwiniana 12: 280 & 281. 1961. Lippia tegulifera Brig. ex Moldenke, Résumé Suppl. 10: 6, in syn. 196. Lippia

temulifera Briq. ex Moldenke, Résumé Suppl. 10: 6, in syn. 1964.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 309—310. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 492. 1904; Prain, Ind. Kew. Suppl. 3: 104. 1908; Moldenke, Lilloa 5: 429. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41, 43, & 96. 1942; Moldenke, Lilloa 10: 343 (1944) and 12: 148. 1946; Moldenke, Alph. List Cit. 1: 264. 1946; Moldenke, Alph. List Invalid Names 15. 1947; Moldenke, Phytologia 2: 386 (1947) and 2: 481. 1948; Moldenke, Lilloa 14: 46 & 47. 1948; Moldenke, Alph. List Cit. 2: 342, 376, 440, 457, 600, & 627 (1948), 3: 837 & 863 (1949), and 4: 1165, 1169, & 1237. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99, 105, & 191. 1949; Moldenke, Résumé 117, 126, 317, & 463. 1959; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Troncoso, Darwiniana 12: 258 & 280—282, fig.12 k—o. 1961; Moldenke, Résumé Suppl. 10: 4 & 6 (1964) and 12: 11. 1965; Moldenke, Phytologia 12: 24 & 430. 1965.

Illustrations: Troncoso, Darwiniana 12: 281, fig. 12 k—o. 1961.

Dioecious shrub or subshrub, 0.3—0.6 m. tall, with a woody caudex at the base; aerial stems erect, woody or indurated, simple or branched; internodes tetragonal, short or very short, pubescent throughout with appressed and also longer ascending-patulous or sometimes crisped ferruginous hairs; leaves decussate-opposite or approximate, abundant, closely appressed to the branches in imbricate fashion, sessile; leaf-blades elliptic tp elliptic-lanceolate, small, 8—20 mm. long, 5—8 mm. wide, shortly acuminate or acute at the apex, more or less convex along the margins, more convex below the middle, regularly and abundantly crenate or crenulate, cordate at the base, stiff, coriaceous, rigid, ferruginous-green, scabrid above, sparsely strigose-pubescent with coarse hairs on both surfaces, also appressed-pubescent beneath, very prominently penninerved, lineate-rugose above; secondaries approximate, parallel, impressed above; heads globose, medium-sized, opposite in the leaf-axils, subsessile or very short-pedunculate, 5—8 mm. long and wide, cinereous-pubescent or incanous; peduncles tetragonal, shorter than the subtending leaves, hardly more than 5 mm. long, pubescent or incanous throughout; bractlets ovate, acuminate at the apex, about equaling the leaves, villous-pubescent on the outer surface; calyx very small, campanulate, about 0.6 mm. long, rather densely antrorsely pubescent, 2-labiate, the lips small, entire or obscurely sublobulate; corolla hypocrateriform, yellow, small, surpassing the calyx-mouth by about 2 mm., the tube exserted, subglabrous, the limb puberulent, the lobes about equal, about 0.5 mm. long, the anterior one longer; stamens and pistil normal for the genus, included; fruit small, smooth, 1.5 mm. long, rather densely villous like the fruiting-calyx, the cocci splitting apart on maturity.

Briquet (1904) proposed this species with 4 constituent varieties, of which I regard the first, var. parvifolia, as the typical one. The type, then, of the species is that of the typical form, collected by Benedict Balansa (no. 1031, in part) on the

campos at Caaguazu, Paraguay, on November 7, 1874, and deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. Briquet describes this typical form as follows: "Caules aerii 30—60 pilis brevibus adpressis et aliis longioribus ascendenti-patulis nunc aliq. crispulis ferrugineis obtecti. Folia creberrima, parva, elliptico-lanceolata, utrinque pilis strigosis grossis sparsis praedita et praeterea subtus adpresse pubescentia, supra aspera, ferrugineo-viridia, superficie 0,8—2 x 0,3—0,8 cm. Capitula demum sect. long. 5—8 x 5—8 mm. subsessilia vel brevissime pedunculata, pedunculis vix ultra 5 mm. altis quam folia brevioribus." He says of the species: "Cette remarquable espèce se place dans le groupe Axilliflorae de la section Zapania: elle ne peut être étroitement rapprochée d'aucune des espèces connues: son port, qui est celui des Oftia, lui donne une place à part." He says that Balansa 1031 is actually a mixture of the typical L. tegulifera, var. ovata, and var. pedunculata.

The second Briquet reference given in the bibliography above is cited at the Instituto Miguel Lillo as "Plantae Hasslerianae XI (1904) 492." The species is obviously very closely related to L. arechavaletae Moldenke.

Collectors have found this plant growing on wet or humid savannas, campos, high campos, and the banks of rivers, at 150 meters altitude, flowering from September to May and in July, fruiting in November and December. Rojas found it on a "campo pendiente Ie loma"; Anisits describes it as "rare" on campos, while Quiroga found it to be "abundant in high sandy uncultivated campos."

It should be noted that the University of Michigan specimen of Ekman 2014 is definitely the typical form of the species, with elliptic leaves, while the Britton Herbarium specimen of the same number is definitely var. ovata, with ovate leaves. Troncoso (1961) says: "Especie polimorfo de la que su autor distingue 4 variedades. La var. parvifolia ha sido considerada por Moldenke como la var. típica. Quadaría así el ejemplar Balansa 1031 pp como tipo. El valor de las restantes: var. ovata, var. pedunculata y var. grisea requerirá un minucioso estudio en base a observaciones de abundante material que permita apreciar la constancia de sus caracteres diferenciales. Por el momento me remito a citarlas como tales. Lippia tegulifera es una especie dioica." She cites the following 31 specimens: PARAGUAY: Balansa 1031, in part (Bf—lectotype, Bm—lectotype, Cb—lectotype, K—lectotype, P—lectotype, Si—lectotype); Hassler 1079 (Cb, K, P), 4958 (Bm, Cb, K, P), 6108 (Bm, Cb, K, P, Si), 6108a (Cb); Jörgensen 3780 (Si); Montes 7188 (Si); T. Rojas 3422 (Si), 5151 (Si), 6087 (Si). ARGENTINA: Corrientes: Burkart 7861 (Si); Ibarrola 3963 (Ml). Misiones: Burkart 14751 (Si), 15307 (Si); D. Rodriguez 697 (K, Ra, Si). Of these she says that Hassler 6108 (Bm, K, P) and T. Rojas 6087 (Si) are definitely staminate specimens; Hassler 6108 (Si), Jörgensen 3780 (Si), and T. Rojas 5151 (Si) are definitely pistillate speci-

mens; while Burkart 7861 (Si) is both staminate and pistillate. Hassler 6108 is definitely var. ovata, 1079 was called var. pedunculata by Briquet, and 6108a was called var. ovata by Briquet.

Material has been misidentified and distributed in herbaria as var. ovata Briq. and as L. pumila Cham. In all, 36 herbarium specimens, including type material of all the names involved, and 6 mounted photographs have been examined by me.

Citations: PARAGUAY: Anisits 1926 (S); Balansa 1031, in part (F--photo of lectotype, N--photo of lectotype, S--lectotype, Si--photo of lectotype, Z--photo of lectotype); Hassler 8994 (F--876815, V), 9142 (Ca--929822, Cb, N, N--photo, V, Z--photo); Jürgensen 3780 [Herb. Osten 22234] (Du--197830, S, Ug, W--1483632), s.n. [Herb. Mus. Argent. Cienc. Nat. 28/2072] (N); Kuntze s.n. [Std-Paraguay, IX.92] (N); T. Rojas 3422 [Herb. Osten 18196] (Ug), s.n. [Herb. Osten 15647] (Ug). ARGENTINA: Corrientes: Ibarrola 3963 (N), 4012 (N, N, S); Ruiz Huidobro 2082 (S), 2169 (N, S, Vi). Formosa: Venturi 9091 (W--1591416). Misiones: Burkart 14751 (N, W--2056385); Ekman 2014, in part (Mi); Montes 1715 (N); Quiroga 419 [Herb. Osten 7682] (Ug), 432 [Herb. Osten 7682] (Ug), 7682 (Go), s.n. [Herb. Osten 7682] (S); D. Rodriguez 697 [Herb. Inst. Miguel Lillo 32236] (Ca--3372, N, W--1802580, W--1858291).

LIPPIA TEGULIFERA var. GRISEA Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 310--311. 1904.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 310--311. 1904; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96 (1942) and [ed. 2], 99 & 191. 1949; Moldenke, Résumé 117 & 463. 1959; Troncoso, Darwiniana 12: 282. 1961.

This variety differs from the typical form of the species in having its aerial stems more robust, over 60 cm. tall, densely griseous with short appressed hairs and longer ascending ones; leaf-blades elliptic-lanceolate, medium in size, rather dense, very acute at the apex, roughened above and pubescent with small scattered hairs, densely and rather softly pubescent beneath, griseous, 2--3 cm. long, 1 cm. wide; heads griseous-canescent, to 1 cm. long and 8 mm. wide, short-pedunculate; peduncles shorter than the subtending leaves, 1--1.5 cm. long; bractlets ovate-acuminate.

The type of this variety was probably also collected by Benedict Balansa, although Briquet cites no collector or number, in pastures on the plain of Pirayu-bi, Paraguay, on February 11, 1878, and is probably deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. Nothing is known to me of this taxon except what is stated in the literature.

LIPPIA TEGULIFERA var. OVATA Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 310. 1904.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 310. 1904; Moldenke, Lilloa 5: 429 (1940) and 8: 426. 1942; Mol-

denke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96. 1942; Moldenke, Alph. List Cit. 1: 26, 263, 264, & 266. 1946; Moldenke, Phytologia 2: 386. 1947; Moldenke, Lilloa 14: 46 & 47. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99, 105, & 191. 1949; Moldenke, Alph. List Cit. 3: 690 (1949) and 4: 1257. 1949; Moldenke, Résumé 117, 126, & 463. 1959; Troncoso, Darwiniana 12: 282. 1961.

This variety differs from the typical form of the species in having its leaves less imbricately crowded, often somewhat larger, to 2 cm. long and 1.5 cm. wide, ovate, rather acutish at the apex, the margins below the middle conspicuously convex, the base conspicuously cordate.

The type of this variety was collected by Benedict Balansa (no. 1031, in part) on the campos at Caaguazu, Paraguay, on November 7, 1874, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. According to Briquet (1904) Balansa 1031 is a mixture of typical L. tegulifera Briq., var. pedunculata, and var. ovata. Similarly, the specimen of Hassler 6108 photographed by Macbride in the herbarium of the Botanisches Museum at Berlin as his type photograph number 17551 was originally labeled "6108", but Briquet avers that this number consists of a mixture, too, and he cites the var. ovata portion as "6108a". Troncoso (1961) regards the true 6108 material as var. pedunculata Briq.

The variety ovata is described as having yellow flowers, like the typical form, grows 20—80 cm. tall, on campos and rocky campos, flowering in September and November. The Britton Herbarium specimen of Ekman 2014 is definitely var. ovata, with ovate leaves, while the University of Michigan specimen of the same number is definitely the typical form of the species, with elliptic leaves.

Material has been misidentified and distributed in herbaria as L. tegulifera Briq. and as L. pumila Cham. In all, 14 herbarium specimens, including type material, and 11 mounted photographs have been examined by me.

Citations: PARAGUAY: Balansa 1031, in part (Br—isotype, F—photo of isotype, N—isotype, N—photo of isotype, Si—photo of isotype, Z—photo of isotype); Hassler 4958 (N), 6108 (Ca—944353, Mi, N, N, S), 6108a [Macbride photos 17551] (It—photo, Kr—photo, N—photo, N—photo, W—photo), 9906 (N, N—photo, V, Z—photo); Hauthal 23 (N). ARGENTINA: Misiones: Ekman 2014 (N, S); A. G. Schulz 7110 (Sz).

LIPPIA TEGULIFERA var. PEDUNCULATA Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 310. 1904.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 310. 1904; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96 (1942) and [ed. 2], 99 & 191. 1949; Moldenke, Résumé 117 & 463. 1959; Troncoso, Darwiniana 12: 280—282, fig. 12 a—j. 1961.

Illustrations: Troncoso, Darwiniana 12: 281, fig. 12 a—j. 1961.

This variety differs from the typical form of the species in having its aerial stems simple, virgate; leaves medium-sized, less imbricate, scarcely exceeding the internodes, elliptic-lanceolate, very acute at the apex, the crenate-dentate teeth more acute, more robust, 2--2.5 cm. long, 6--8 mm. wide, the indumentum of the stem and leaves as in var. ovata; heads longer-pedunculate, the peduncles equaling the leaves or sometimes surpassing them, to 2 cm. long, the bractlets narrower and more acute.

The type of this variety was collected by Benedict Balansa (no. 1031b) in clearings in the forests, Cordillera de Peribebui, Paraguay, on January 11, 1877, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. Balansa 1031 is, according to Briquet (1904), a mixture of typical L. tegulifera, var. ovata, and var. pedunculata. This portion was apparently collected at a different locality and on a different date than the other two portions previously discussed. It is said to have had a heavy woody rootstock. Troncoso (1961) states that Briquet regarded Hassler 1079 as this variety; she regards Hassler 6108 as this variety, too, but I cite this number under var. ovata. Nothing further is known to me of var. pedunculata.

LIPPIA TEPICANA Moldenke, Phytologia 1: 454--455. 1940.

Synonymy: Lippia mexicana Moldenke, Alph. List Invalid Names Suppl. 1: 14, in syn. 1947. Lantana canescens Benth. ex Moldenke, Résumé 304, in syn. 1959 [not L. canescens H.B.K., 1817].

Bibliography: Moldenke, Phytologia 1: 454--455 (1940) and 1: 504. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 17 & 96. 1942; Moldenke, Alph. List Cit. 1: 233. 1946; E. J. Salisb., Ind. Kew. Suppl. 10: 134. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 14. 1947; Moldenke, Alph. List Cit. 2: 474, 477, & 595 (1948) and 3: 788. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 31 & 191. 1949; Moldenke, Résumé 37, 304, 314, & 463. 1959; Langman, Select. Guide Lit. Flow. Pl. Mex. 515 & 1010. 1964; Moldenke, Phytologia 12: 108, 111, 112, & 363. 1965.

Open-crowned shrub or tree, 1.2--1.8 m. tall; branches and branchlets rather slender, acutely or obtusely tetragonal, sometimes corky-margined, densely puberulent with grayish appressed hairs, less so in age, densely resinous-punctate; nodes annulate; principal internodes 0.5--3.5 cm. long; leaves decussate-opposite; petioles slender, 0.5--1.5 cm. long, varying from densely velutinous when young to merely short-pubescent or strigose and densely resinous-gramular; leaf-blades firmly thick-chartaceous, uniformly gray-green on both surfaces or somewhat lighter beneath, very rough-scabrous and bullate above, elliptic or lanceolate, 2.5--9 cm. long, 1--5 cm. wide, acute at the apex, regularly serrulate from almost the base to the apex with small acute antrorse teeth with subrevolute margins, acuminate at the base, pilose above with harsh bulbous-based whitish hairs, densely short-pubescent or tomentellous beneath (velutinous-tomentose when young); midrib slen-

der, mostly impressed above (or appearing as though raised by being more densely pilose), rounded-prominent beneath; secondaries slender, 5—9 per side, arcuate-ascending, impressed above, prominent beneath; veinlet reticulation abundant, impressed above, sharply prominent beneath; inflorescence axillary, paniculate, one panicle and sometimes also 1 or 2 single-headed peduncles issuing from each axil or sometimes only several single-headed peduncles; the simple inflorescences 1—3 cm. long, the panicles to 9 cm. long; peduncles and inflorescence-branches very slender, 1—4.5 cm. long, densely puberulent, short-pubescent, or strigose with cinereous hairs; panicles with 1—3 whorls of capitate branches; heads hemispheric during anthesis, oblong in fruit, densely many-flowered, 3—14 mm. long, 5—10 mm. wide; bractlets large, conspicuous, imbricate in many ranks, persistent, dry and scarious in fruit, reniform, 3—5 mm. long, 4—6 mm. wide, densely puberulent on both surfaces during anthesis, glabrate and prominently venose in fruit; receptacle 3—7 mm. long.

The type of this species was collected by Edward Palmer (no. 1969) at Tepic, Nayarit, Mexico, between January 5 and February 6, 1892, and is deposited in the Britton Herbarium at the New York Botanical Garden. Lantana canescens Benth. is based on Arsène 3243 from Michoacán, Mexico, deposited in the United States National Herbarium at Washington. Humboldt, Bonpland, and Kunth's species of the same name is a valid species in Lantana.

Standley identified the type of Lippia tepicana as Lantana involucrata L., noting that "the Mexican form differs somewhat from the West Indian, but not consistently". To this Britton has appended his comment "But this is not the West Indian plant!"

Lippia tepicana has been found on grassy slopes with scattered shrubbery on hills, at altitudes of 1325 to 2800 meters, flowering in January, February, May, and November, fruiting in February, March, and May. Gentry & Gilly found it "in highly mixed tropical forest dominated by pine and oak on mountain slopes with clay soils volcanically derived" in Nayarit. Material has been misidentified and distributed in herbaria under the names L. callicarpaefolia H.B.K., L. pringlei Briq., L. umbellata Cav., Lantana involucrata L., and even Melampodium sp. in the Carduaceae!

In all, 19 herbarium specimens, including the types of all the names involved, have been examined by me.

Citations: MEXICO: Jalisco: H. S. Gentry 5353 (Fs, N). Michoacán: Arsène 3243 (W—1000868). Nayarit: DeLeon 1618 (Mi), 1629 (Mi); Gentry & Gilly 10484 (Rf); M. E. Jones 23235 (Ca—400873, Po—153924), 23416 (Gg—172647, N, N, Po—191958), 23417 (Po—191959); Edw. Palmer 1969 (Ca—770321—isotype, Cp—isotype, Fs—isotype, Mi—isotype, N—type, S—isotype).

LIPPIA THYMOIDES Mart. & Schau. ex Schau. in A. DC., Prodr. 11: 586—587. 1847.

Synonymy: Lippia ocymoides Mart. & Schau. ex Briq. in Engl. &

Prantl, Nat. Pflanzenfam. 4 (3a): 152, sphalm. 1894.

Bibliography: Schau. in A. DC., Profr. 11: 586—587. 1847; Schau. in Mart., Fl. Bras. 9: 240. 1851; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 96. 1894; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 152. 1895; Solered., Bull. Herb. Boiss., sér. 1, 6: 628. 1898; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 38 & 96. 1942; Moldenke, Alph. List Cit. 2: 429 (1948) and 3: 691 & 711. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 191. 1949; Moldenke, Résumé 94 & 463. 1959; Moldenke, Résumé Suppl. 8: 5. 1864; Moldenke, Phytologia 12: 24. 1965.

Subshrub, 1—1.3 m. tall; branches crowded, spreading, virgate, hirtellous-scabrous, with abbreviated axillary branchlets; leaves decussate-opposite, small, 4—6 mm. long, 2 mm. wide, oblong-cuneate, rather acute or obtuse at the apex, entire and revolute along the margins, 1-veined, scabrous above, glandular-pulverulent and somewhat grayish beneath, fasciculate-crowded on the sterile branchlets; heads solitary in the upper leaf-axils, very short-pedunculate, subglobose or oval, compact, about 8 mm. long; bractlets subherbaceous, imbricate, ovate-lanceolate, acute at the apex, 3-veined, glandular-pulverulent on the back, ciliate along the margins, equaling the corolla-tube; corolla rose, yellow in the throat, subinfundibular, glandular-pubescent on the outside; fruit normal for the genus.

This species was based by Schauer on two collections (no. 1955) made by Carl Friedrich Philipp von Martius on the campos and in the woods of the Catingas at Feira de S. Anna and at Maracas, Bahia, Brazil, deposited in the herbarium of the Botanisches Museum at Munich and photographed there by Macbride as his type photograph number 20335. Schauer classified the species in his section Zapania, subsection Axilliflorae. It is known thus far only from the original collections. In all, 4 mounted phototypes have been examined by me.

Citations: BRAZIL: Bahia: Martius 1955 [Herb. Monac. 137; Macbride photos 20335] (It—photo of type, Kr—photo of type, N—photo of type, W—photo of type).

LIPPIA TORRESII Standl., Field Mus. Nat. Hist. Publ. Bot. 18: 1010—1011. 1938.

Synonymy: Lippia torresi Standl., in herb.

Bibliography: P. C. Standl., Field Mus. Nat. Hist. Publ. Bot. 18: 1010—1011. 1938; Moldenke, Alph. List Common Names 7. 1939; Moldenke, Suppl. List Common Names 5. 1940; Moldenke in Woodson & Schery, Ann. Mo. Bot. Gard. 27: 335—336. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 23, 24, & 96. 1942; Moldenke, Phytologia 2: 107. 1945; Moldenke, Alph. List Cit. 1: 7. 1946; E. J. Salisb., Ind. Kew. Suppl. 10: 134. 1947; Moldenke, Phytologia 2: 384. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 86. 1948; Moldenke, Alph. List Cit. 2: 390 (1948), 3: 940 & 945 (1949), and 4: 999—1001. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 39, 41, & 191. 1949; Dayton, Phytologia 4: 259. 1953; Briznicky, Stern, & Chambers, Trop. Woods 109: 78. 1958; Moldenke, Ré-

sumé 47, 48, & 463. 1959; Moldenke, Résumé Suppl. 8: 1. 1964; Moldenke, Phytologia 12: 504. 1966.

Large forest tree, 4--24 m. tall; crown broad, flat or rounded; trunk 15--90 cm. in diameter at breast height; bark neutral gray, brownish, or light-brown to gray-brown, neutral-brown, or dark-brown, moderately striate with raised ridges, rough; wood very hard, the sapwood light, the heartwood dark; cambium layer greenish; branches wide-spreading; young branchlets greenish, acutely angular, roughly quadrate or square, densely hispidulous with short sordid hairs; leaves decussate-opposite, aromatic, with a mint-like odor, rather large, petiolate; petioles slender, 1.5--2.5 cm. long, densely hispidulous; leaf-blades thick and fleshy when fresh, membranous when dry, barely or slightly stiffened or "a little stiffened but soft", bright-green or dark emerald-green above, light- or pale-green to gray-green beneath, not shiny, ovate-oblong, mostly 12--21 cm. long, 6--9 cm. wide, acute or subacuminate at the apex, sharply crenulate along the margins, rather abruptly cuneate-attenuate at the base, scabrous and rugose or very rugose above, sparsely villosulous but soft to touch above and more or less bullate with sharply reticulate veinlets, much paler beneath and densely velutinous-pilose with straight spreading but more or less entwined hairs throughout; midrib slender, prominent beneath; secondaries about 10 per side, arcuate-ascending with a rather broad angle; peduncles axillary, fasciculate, very slender, about 1.5 cm. long, puberulent or densely hispidulous; flowers densely capitate, not fragrant but attracting many insects; heads small, round or flattened, globose and 1 cm. wide when in fruit; bractlets light- or pale-green, violet-purple on the top, glandular, slightly glutinous, membranous and accrescent in the fruiting stage and then much blown by the wind, venose, ciliolate on the margins, otherwise glabrous, broadly rounded at the apex; calyx almost 2 mm. long, densely villosulous; corolla hypocrateriform, yellow, pale-yellow, or light primuline yellow to primrose, greenish-yellow, or lemon-chrome, sometimes greenish-white or white, sometimes lemon-chrome and maturing cream-color, almost completely glabrous on the outer surface, the tube slender, 2 mm. long, the lobes 4 or 5, expanded or reflexed, compressed, about 1 mm. long, puberulent.

The type of this handsome species was collected by Austin F. Smith (no. H.436) at Tapezco de Zarcero, at an altitude of 1950 m., Alajuela, Costa Rica, in March, 1938, and is deposited in the herbarium of the Chicago Natural History Museum. The species is named in honor of Rubén Torres Rojas, Costa Rican naturalist and educator, rector of the national university, noted for his botanical and zoological collecting in Costa Rica. Smith notes that the leaves grow much larger than those on flowering specimens in herbaria and that the flower-heads have the "appearance of rosettes resembling Lantana or a tiny artichoke". The flowers are described as "yellow" on P. H. Allen 1481 and Skutch 4191, "greenish-yellow" on P. H. Allen 1565, "pale-yellow" on Skutch 5467, "light primuline-yellow" on A. F. Smith H.187, "white" on A. F. Smith 83

and Stork 4183, "primrose to pale-yellow or cream-color" on A. F. Smith 1569, "cream" on Lems 5049, and "lemon-chrome maturing to cream-color" on A. F. Smith P.2274. Wood samples of Stork 4590 are deposited in the Lundell and University of Michigan herbaria, and a pollen sample taken from P. H. Allen 1565 is represented in the slide collection of the Harvard University herbarium.

The species has been found in forests and at the edge of forests, in potreros and pastures, in heavy loam or in rich loam and mould, in semi-shade, on brushy slopes, and in the fog zone influence, at altitudes of 1130 to 2300 meters, flowering in January, February, April, June, October, and November, fruiting in January, March, and April. A. F. Smith found it at the "edge of woodland, nearly open exposure in heavy clay-loam soil at upper limit of tropical zone, Pacific watershed.....fairly common component of forest especially in drier parts.....Caribbean cloud forest zone at edge of forest in half-shade in mold and loam soil." Lems found it in "upper montane forest with Quercus copeyensis, Q. costaricensis, and abundant epiphytes."

Vernacular names recorded for it are "caragra", "caragra negra," and "caragre". Material has been misidentified and distributed in herbaria as L. substrigosa Turcz.

In the Harvard University herbarium there are deposited the following specimens identified as L. torresii, but not as yet checked by me: COSTA RICA: San José: E. L. Little 6015 [U. S. Dept. Agr. Forest Serv. 95036] (A). PANAMA: Chiriquí: M. E. Davidson 793 (A), 1356 (A). Standley (1938) also cites the following, not as yet seen by me: COSTA RICA: Alajuela: A. F. Smith H. 187 (F), H.436 (F—type); Standley & Torres Rojas 47937 (F). San José: P. C. Standley 43519 (F).

In all, 26 herbarium specimens have been examined by me.

Citations: COSTA RICA: Alajuela: A. F. Smith 83 [Stork 4183] (Mi), 1569 (N), H.187 (N), P.2274 (A, Ca—12727). Cartago: Lems 5049 (N); Tonduz 1876 (Br). Heredia: Skutch 5467 (W—2351972). San José: Skutch 4191 (A, N, S); Stork 4590 (Ld, Mi); Tonduz 1700 (Br, Br, N), 7843 (Br), s.n. [Herb. Inst. Physico-geogr. Nac. Costaric. 17841] (Br, N). PANAMA: Chiriquí: P. H. Allen 1481 (G, N), 1565 (G, N, N); Stern & Chambers 78 (Bs, Z).

LIPPIA TRACHYPHYLLA Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 312—313. 1904.

Synonymy: Lippia trachyphylla Mold. ex Stellfeld, Trib. Farmac. 19 (10): 169, sphalm. 1951.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 312—313. 1904; Prain, Ind. Kew. Suppl. 3: 104. 1908; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96. 1942; Moldenke, Lilloa 8: 426 (1942) and 10: 380. 1944; Moldenke, Alph. List Cit. 1: 27. 1946; Moldenke, Phytologia 2: 336, 337, & 386. 1947; Moldenke, Lilloa 14: 47. 1948; Moldenke, Castanea 13: 118. 1948; Moldenke, Alph. List Cit. 2: 448, 598, & 626 (1948), 3: 693 (1949),

and 4: 1293. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81, 97, 99, 105, & 191. 1949; Stellfeld, Trib. Farmac. 19 (10): 169. 1951; Angely, Fl. Paran. 7: 12. 1957; Moldenke, Résumé 94, 114, 117, 126, 317, & 463. 1959; Angely, Fl. Paran. 16: 60 (1960) and 17: 46. 1961; Troncoso, Darwiniana 12: 258, 282, & 283, fig. 13. 1961; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Moldenke, Phytologia 12: 24, 90, & 290. 1965; Moldenke, Résumé Suppl. 12: 4. 1965.

Illustrations: Troncoso, Darwiniana 12: 283, fig. 13. 1961.

Dioecious decumbent herb; stems procumbent, issuing from a hard thick rootstock, diffusely branched; branches dark-green, sparsely strigose above with appressed antrorse hairs; middle internodes 2—5 cm. long; leaves decussate-opposite, medium in size; petioles 3—6 mm. long; leaf-blades rather thick, rigid, dark-green on both surfaces, ovate or ovate-elliptic, 3—4.5 cm. long, 2—2.5 cm. wide, acute or subobtuse at the apex, more convex along the margins below the middle and conspicuously crenate-serrate (the teeth 1—1.5 mm. long and 2—5 mm. apart), broadly rounded-cuneate at the base and prolonged into the petiole, pilose above with small antrorse hairs that are thickened at their base, conspicuously scabrous, appressed-strigose beneath especially on the venation, sparsely so on the lamina; venation prominently pennineryed, the midrib lineate above, promimulent beneath, the 4 or 5 secondaries anastomosing toward the margins, lineate above, promimulous beneath; inflorescence axillary in the upper leaf-axils, pedunculate; peduncles shorter than the subtending leaves, 1—1.5 cm. long, appressed strigose-pubescent, the hairs beneath the head mixed with stipitate glands; heads subspheric, about the size of a large pea (Pisum sativum), to 8 mm. long and 10 mm. wide, grayish; lower bractlets ovate-acuminate, to 5 mm. long, sometimes surpassing the head, densely strigose-canescent on the outside, the rest about equaling or shorter than the flowers; calyx minute, campanulate, hardly 0.5 mm. long, subbilabiate, the lips subentire, pubescent on the outside; corolla hypocrateriform, yellow or rose-violet, exserted, surpassing the calyx-mouth by 3 mm., the tube glabrescent below, pubescent above, the limb pubescent on the outside, the lobes 4, short and ovate, the anterior one longer, to 0.5 mm. long; stamens and pistil normal for the genus, included; mature fruit not known.

The type of this species was collected by Benedict Balansa (no. 4626) on the sandy borders of the Y'-acan-guazu near Valenzuela, Paraguay, in November, 1882, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, where it was photographed by Macbride as his type photograph number 24672.

Briquet (1904) has this to say about this plant: "Espèce très caractérisée, voisine du L. asperrima Cham. dont elle diffère par ses feuilles ovées et petiolées, ses tiges rampantes diffusément rameuses, ses pédoncules plus courts, à indument strigoso-appliqué à glandes stipitées très courtes et localisées sous les capitules, ses corolles d'un rose-violacé (jaunes dans le V. as-

perrima) etc." In speaking of his L. modesta, he says "Cette espèce est à peu près intermédiaire entre le L. asperrima Cham. et le L. trachyphylla Briq. ci-apres décrit. Elle est caracterisée par une hétérophyllie assez marquée, des feuilles à peine rudes et non pas vraiment scabres et bien moins rugueuses que dans ces deux espèces. L'indument des pédoncules ressemble à celui du L. trachyphylla, mais ceux-ci sont plus allongés et plus tenus. Autant qu'on peut en juger sur le sec, la corolle paraît être jaune comme dans le L. asperrima." If it is really true that L. trachyphylla differs from its relatives in having rose-violet flowers (as stated on the type collection), then the Fries 616, cited below, which is said to have had yellow flowers should be examined again, as it may not be L. trachyphylla after all.

Lippia trachyphylla has been found growing on campos and open dry campos and along river borders, at altitudes of 2385 to 3000 meters, blooming in January, March, October, and November. Material has been misidentified and distributed in herbaria as L. turnerifolia Cham.

The record of L. trachyphylla from Paraná, Brazil, given by me in previous publications, was based on Jönsson 35a, which proves to be L. turnerifolia Cham.

In all, 4 herbarium specimens and 4 mounted phototypes have been examined by me.

Citations: BOLIVIA: Cochabamba: Kuntze s.n. [Tunari, V.92] (N). Province undetermined: Cuming 150 (V). PARAGUAY: Balansa 4626 [Macbride photos 24672] (It—photo of type, Kr—photo of type, N—photo of type, W—photo of type). ARGENTINA: Salta: R. E. Fries 616 (S); T. Meyer 4610 (Ca—906139).

LIPPIA TRISTIS Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1161. 1904.

Synonymy: Lippia tristis var. normalis Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1161. 1904. Lippia angustifolia Chod. ex Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1159, in syn. 1904 [not L. angustifolia Cham., 1832, nor Cham. & Schlecht., 1947, nor H.B.K., 1947, nor Morong, 1904, nor Schau., 1959]. Lippia turneraefolia Chod. ex Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1159, in syn. 1904 [not L. turneraefolia Cham., 1851]. Lippia turnerifolia Chod. ex Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1159, in syn. 1904 [not L. turnerifolia Cham., 1832]. Lippia tristis var. tristis Troncoso, Darwiniana 12: 284. 1961.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1159—1161. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 495 & 496. 1904; Prain, Ind. Kew. Suppl. 3: 104. 1908; Moldenke, Lilloa 5: 429. 1940; Moldenke, Suppl. List Invalid names 6. 1941; Moldenke, Lilloa 8: 426. 1942; Moldenke, Alph. List Invalid Names 32. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1],

41 & 96. 1942; Moldenke, Alph. List Cit. 1: 263 (1946) and 2: 600. 1948; Moldenke, Lilloa 14: 47. 1948; Moldenke, Alph. List Cit. 3: 693. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99 & 191. 1949; Moldenke, Résumé 117, 318, & 463. 1959; Troncoso, Darwiniana 12: 258, 259, 267, 283—285, & 287, fig. 14. 1961; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Moldenke, Phytologia 12: 24 & 139. 1965; Moldenke, Résumé Suppl. 12: 10 & 11. 1965.

Illustrations: Troncoso, Darwiniana 12: 284, fig. 14. 1961.

Medium-sized subshrub, 20—60 cm. tall, dioecious, with a woody tuberous caudex; aerial stems erect, strict, simple or subsimple, obtusely tetragonal or subterete, green, often nigrescent above in drying, more or less strigose-pilose with antrorse hairs, longer spreading hairs interspersed among them (sometimes abundant, sometimes few); leaves decussate-opposite, dimorphic, sessile or subsessile; lower leaf-blades green, oval to ovate or ovate-subrotund, small, obtuse at the apex, the upper cauline ones narrow-lanceolate to lanceolate or elliptic-lanceolate, larger, 3—6 cm. long, 0.5—1 cm. wide, acute at the apex, entire or subentire along the margins, rounded-extenuate at the base, strigose-pilose or substrigose on both surfaces with small antrorse hairs, sometimes roughened, with longer spreading and glandulose hairs usually present, often nigrescent (especially above) in drying, 3- or 5-plinerved at the base, sometimes rugose above because of the beautifully reticulate venation which is conspicuously prominent beneath, not punctate beneath; inflorescence axillary, pedunculate; peduncles surpassing the lower leaves, about equaling (rarely much longer than) the upper ones, slender, strigose-pilose with antrorse hairs and often also glandular-pilosulous; heads ovate to ovoid-subglobose, about 5 mm. long and wide during anthesis, 10 mm. long and wide in fruit; exterior bractlets green, elliptic-lanceolate and 3 mm. long by 1.5 mm. wide during anthesis, broadly ovate and 5—6 mm. long by 3 mm. wide after anthesis, acuminate at the apex, slightly surpassing the heads and easily becoming nigrescent in drying, the inner ones reduced and narrower, all strigose or substrigose with antrorse hairs and more or less glandular-pilosulous, about equaling the flowers; calyx during anthesis very small, hardly over 0.5 mm. long, pubescent on the outside, obscurely subbilabiate, the lips subentire; corolla hypocrateriform, yellow or lemon-yellow, small, densely puberulent on the outside, surpassing the calyx by about 2 mm., the tube exserted, the lobes rounded, about 0.5 mm. long, the anterior one larger; stamens and pistil normal for the genus, included; mericarps densely white-tomentose (like to calyx-segments) outside, splitting apart with the calyx-segments, about 1.6 mm. long and 1.5 mm. wide, smooth, the inner surface excavated.

This species was based on two collections made in Paraguay by Emil Hassler — the first (no. 4554) in September in the campo near Carimbatay, and the other (no. 5461, in part, or 5461a) in November in the campo near Igatimi. The former of these has been designated as lectotype of the species by Troncoso and was photographed by Macbride in the Delessert Herbarium at the Conservatoire et Jardin

Botaniques at Geneva as his type photograph number 24674.

Briquet (1904) says: "Cette très remarquable espèce se place dans le voisinage du L. heterophylla. Elle se reconnait au premier coup d'oeil à ses feuilles triplinerviées our quintuplinerviées à la base, à nervures très acroscopes. Le L. turnerifolia en diffère toto caelo par la forme des feuilles et la nervation, l'indument des pédoncules, la forme des capitules et des bractées, et les calices non laineux à la maturité. Quant au L. angustifolia, il appartient à un groupe tout différent à capitules disposés en racine terminal, alors que le L. tristis appartient au groupe des Euzapania à capitules axillaires." For his var. normalis he says: "Folia caulinaria superiora lanceolata vel elliptico-lanceolata, superficie 3—6 x 0,5—1 cm. Pedunculi inferiores folia superantes, superiores laminam circiter aequantes. Caulis et folia pilis strigosis et aliis longioribus patulis praedita." He also states that it is related to L. coriacea Briq. In the Instituto Miguel Lillo the original bibliographic references for this species and its trinomial synonym are given as "Plantae Hasslerianae XI (1904) 495 & 496".

The plant has been found growing in fields and on campos, flowering in September and November. Troncoso (1961) says: "Especie basada en los sintipos Hassler 4554 y 5461a. Debe considerarse como lectotipo Hassler 4554, por figurar en la serie de fototipos del Museo de Chicago. Especie dioica. Ha dibujado las flores ♂ del ejemplar Hassler 4554 pero el mismo ejemplar posee individuos ♀. Lamentablemente el material fue devuelto a Ginebra antes de haber observado el carácter dioico del mismo. La bráctea fructífera dibujada, anchamente oval, y la observación del fototipo, (los dos ejemplares del centro son ♀, los de los costados ♂) me permiten afirmarlo. El sintipo Hassler 5461a es un individuo ♂. Sus flores son tempranamente vaducas por falta de fecundación, el cáliz falta o se halla reducido a dos dimimutas escamitas membranáceas, de no más de 0,5 mm, que quedan adheridas al raquis floral a ambos lados del punto de inserción de la corola; ésta es infundibulariforme, ensanchada en el lügar de inserción de los estambres, su gineceo aunque presente es abortivo.

"Como al describir la especie, Briquet da caracteres de sus dos variedades: var. normalis y var. aberrans, considero necessario redescribirla en base exclusivemente al lectotipo Hassler 4554, tanto más cuanto la var. aberrans pasa a ser una especie afin pero diferente.

"Sufrútice perenne dioico, de 30—40 cm de alt., rizoma tuberoso-leñoso, grueso, que emite numerosos tallos aéreos, erectos, delgados, subcilíndricos, subestriados, verdes, que al secarse ennegrecen en el ápice, con largos pelos extendidos y pelos estrigoso mezclados con pelitos glandulosos, breves, más abundantes hacia el ápice de los tallos. Hojas opuestas, dimorfas, las inferiores pequeñas, ovales a oval-redondeadas o espatuladas, de 0,3—0,8 X 0,5—1 cm de lat. y long., subsésiles, enteras o con un

diente hacia el ápice, las superiores mayores, lanceoladas, agudas, atenuadas hacia la base, subsésiles, de 0,5—0,8 X 2,5—5 cm de lat. y long. respect., enteras o con 1—2 dientes en el ápice, de borde recurvo, ennegreciendo al secarse, principalmente hacia la base, 3-plinervias, nervaduras paralelas prominentes y lámina marcadamente reticulado-venosa en el envés, con pelos rigidos, subestrigosos sobre los nervios y retículos pubescentes o glanduloso-pubescentes a subglabros; pelos extendidos, callosos en la base en el haz, particularmente sobre el borde. Capítulos axilares, subglobosos, solitarios (rara vez 2 por axila), largamente pedunculados, pedúnculos delgados, filiformes, de 2—5 cm de long., los inferiores más largos (4—5 cm), los superiores más breves igualando las hojas, híspidos y con pelitos breves, glandulosos, más densos havia al ápice. Flores diclinas, las masculinas con brácteas elíptico-lanceoladas, de 3,5—4 X 0,5—0,7 cm de long. y lat., de igual longitud que las flores o poco más breves, híspidas y glanduloso-pilosas hacia el ápice; cáliz diminuto, difilo, pronto caduco, membranáceo, glabro o ligeramente pubescente; corola citrina o amarilla (según el autor), infundibulariforme, bilabiada, labio anterior 3-lobado, lóbulos redondeados, lóbulo posterior más pequeño, tubo breve, pubescente exteriormente; estambres 4, didínamos, subsesiles, inclusos, insertos en la porción superior del tubo corolar. Gineceo de la flor ♂ aparentemente normal pero abortado funcionalmente (las flores caen sin fructificar). Flores ♀ no vistas. Fruto (según Briquet) es quizocárpico, separable espontáneamente en 2 mericarpios cubierto por el cáliz acrescente, densamente albo-tomentoso, de superficie dorsal lisa, convexa y cara interna excavada." She cites Hassler 4554 (Cb—cotype) and 5461a (X—cotype).

It should be noted here that the names L. angustifolia Cham. & Schlecht., L. angustifolia H.B.K., and L. angustifolia Schau. are all synonyms of the valid L. angustifolia Cham., while L. angustifolia Morong is a synonym of the valid L. morongii Kuntze; L. turneraefolia Cham. is a synonym of the valid L. turnerifolia Cham.

In all, 4 herbarium specimens and 4 mounted photographs, including type material of most of the names involved, have been examined by me.

Citations: PARAGUAY: Hassler 4554 [Macbride photos 24674] (Ca—944354—cotype, It—photo of cotype, Kr—photo of cotype, N—cotype, N—cotype, N—photo of cotype, S—cotype, W—photo of cotype).

LIPPIA TRISTIS var. ABERRANS Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1161. 1904.

Synonymy: Lippia aberrans (Briq.) Troncoso, Darwiniana 12: 258 & 267—268, fig. 5. 1961.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1161. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 496. 1904; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96 (1942) and [ed. 2], 99 & 191. 1949; Moldenke, Résumé 117 & 463. 1959; Troncoso, Darwiniana 12: 258, 259, 267—268, fig. 5, & 285. 1961; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Mol-

denke, Résumé Suppl. 5: 7. 1962; Moldenke, Phytologia 12: 24. 1965.

Illustrations: Troncoso, Darwiniana 12: 268, fig. 5. 1961.

This variety differs from the typical form of the species in having its pubescence on the stems, leaves, and peduncles only strigose, the peduncles 2--3 times as long as the subtending leaves, 7--12 cm. long, and the leaf-blades narrow-lanceolate, pellucid-punctate on the lower surface, with the lateral veins hardly visible. It is said to grow 50 cm. tall, to be dioecious, and to have yellow corollas, inhabiting burned campos, flowering in March. At the Instituto Miguel Lillo the original bibliographic reference is cited as "Plantae Hasslerianae XI (1904) 496."

The type of the variety was collected by Emil Hassler (no. 5461) on the campo near Igatimi, Paraguay, in November, 1898, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva.

Troncoso (1961) says: "Briquet identificó el ejemplar Hassler 5461 pp. como L. tristis var. aberrans. El estudio del ejemplar tipo del Herbario de Ginebra me permite afirmar que se trata de una especie bien diferente de L. tristis. Difiere de esta especie por sus larguísimos pedúnculos que sobrepasan 2 a 3 veces la longitud de las hojas (7—12 cm de long.), por sus hojas angostamente lanceoladas, con nervios laterales poco visibles y con puntos pelúcidos en el envés de la lámina. L. tristis posee dimorfismo foliar con hojas inferiores ovales, muy pequeñas, obtusas, las superiores angostamente lanceoladas y mayores; nervaduras marcadamente prominentes en el envés, lámina reticulado-venosa y sin puntos pelúcidos. Además la pubescencia es muy diferente, exclusivamente estrigosa en tallos, hojas y pedúnculos en L. aberrans; pelos subestrigosos, pelos largos extendidos y pelitos breves, glandulosos en L. tristis (ver fig. 14). Por todos estos caracteres diferenciales considero que la variedad aberrans debe pasar a constituir una nueva especie.

"L. aberrans es una especie dioica, consistuyendo el ejemplar Hassler 5461 del herbario del Ginebra el individuo femenino (ver figs.). Rojas 5268, aunque algo mayor en el porte, representaría el individuo masculino." She cites from Paraguay: Hassler 546 (Cb--type), 9117 (Bm, Cb); T. Rojas 5268 (Si), not as yet seen by me.

In all, 5 herbarium specimens, including type material of both names involved, and 2 mounted photographs have been examined by me.

Citations: PARAGUAY: Hassler 5461 (N--isotype); Jörgensen 4583 (Cp, N, N, N--photo, S, Z--photo).

LIPPIA TROLLII Moldenke, Phytologia 6: 446—447. 1959.

Bibliography: Moldenke, Phytologia 6: 446—447. 1959; Moldenke, Biol. Abstr. 33: 1862. 1959; Moldenke, Résumé 425 & 463. 1959; Moldenke, Résumé Suppl. 1: 7. 1959; Hocking, Excerpt. Bot. A.5: 44. 1962.

Shrub; branches rather slender, gray, decidedly tetragonal, gla-

brescent, pithy; branchlets and twigs very slender, tetragonal, very densely short-pubescent, often more or less aculeate with scattered thorns; nodes not annulate; principal internodes 1—2.5 cm. long; leaves decussate-opposite; petioles very short, usually 1—3 mm. long, densely white-pubescent; leaf-blades thin-chartaceous, rather dark-green above, much lighter beneath, elliptic or ovate, 2—3.8 cm. long, 1.1—2.1 cm. wide, acute or subacute at the apex and base, regularly serrate from near the base to the apex with appressed antrorse teeth, rather sparsely pubescent above with somewhat bulbous-based hairs, very densely pubescent beneath; midrib slender, plane or subimpressed above, promimulous beneath; secondaries filiform, 4—8 per side, ascending, not much arcuate, mostly terminating in the simuses between the teeth, slightly impressed above, slightly promimulous beneath; veinlet reticulation indiscernible above, obscure or indiscernible beneath; inflorescence terminal, forming a simple or compound raceme 5—9 cm. long and 2—4 cm. wide; peduncles slender, tetragonal, about 2 cm. long, densely short-pubescent like the twigs; rachis slender, tetragonal, densely short-pubescent; bracts foliaceous, similar to the uppermost leaves but smaller, narrow-elliptic, 4—15 mm. long, 1—5 mm. wide, densely short-pubescent with whitish hairs, one pair at each node of the rachis; individual heads 2 or 3 per node, many-flowered, very dense, 7—9 mm. long, about 7 mm. wide, on very slender secondary peduncles 5—6 mm. long and densely whitish-villosulous; bractlets elliptic or elliptic-lanceolate, about 4 mm. long, 1.5—2 mm. wide, acute at the apex, usually more or less falcate and conduplicate, scattered-pilosulous with rather stiff whitish hairs, more densely so on the margins; calyx minute, densely villous; corolla hypocrateriform, its slender tube about 4 mm. long, the limb 2 mm. wide, glabrous on the outside, barbulate in the throat within; fruit not seen.

The type of this distinctive species was collected by Karl Troll (no. 1207) -- in whose honor it was named -- at Vallegrande, Santa Cruz, Bolivia, at an altitude of 1900 meters, on January 28, 1928, and is deposited in the herbarium of the Botanisches Museum at Berlin. The species has been found at altitudes of 1500 to 1900 meters, flowering in January.

In all, 3 herbarium specimens, including the type, have been examined by me.

Citations: BOLIVIA: Santa Cruz: Troll 1054 (B), 1207 (B—type, Z—isotype).

LIPPIA TURBINATA Griseb., Abhand. Kaiser. Gesell. Wiss. Gött ting. 19: 243. 1874.

Synonymy: Lippia disepala R. A. Phil., Anal. Univ. Chile 90: 622. 1895. Lippia aprica R. A. Phil., Anal. Univ. Chile 91: 415. 1896. Lippia globiflora var. microphylla f. glabriuscula Kuntze, Rev. Gen. Pl. 3 (2): 252. 1898. Lippia microphylla f. glabriuscula Kuntze ex Moldenke, Prelim. Alph. List Invalid Names 31, in syn. 1940. Lippia poleo Lillo ex Moldenke, Suppl. List Invalid

Names 6, in syn. 1941. Lippia poleo var. angustifolia Lillo ex Moldenke, Résumé Suppl. 10: 6, in syn. 1964.

Bibliography: Griseb., Abhand. Kaiser. Gesell. Wiss. Götting. 19: 243. 1874; Lorentz, Veg. Nordeste Prov. Entre Rios, ed. 1, 150. 1878; Griseb., Abhand. Kaiser. Gesell. Wiss. Götting. 24: [Symb. Fl. Argent.] 278. 1879; Lillo, Fl. Tucuman 94. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 96. 1894; R. A. Phil., Anal. Univ. Chile 90: 622 (1895) and 91: 415. 1896; Kuntze, Rev. Gen. Pl. 3 (2): 252 & 253. 1898; Durand & Jacks., Ind. Kew. Suppl. 1: 250. 1903; Hayek in Engl., Bot. Jahrb. 42: 166. 1908; Tavares, Broter. Zool. 13: 97—98, pl. 3, fig. 1—5. 1915; Alvarez, Fl. Santiago del Estero 106. 1919; Sanzin, Anal. Soc. Cient. Argent. Buenos Aires 88 (i—iv): 102. 1919; Doming., Mat. Med. 117. 1928; Seckt, Fl. Cordob. 418. 1929—1930; Stapf, Ind. Lond. 4: 125. 1930; Seckt, Rev. Univ. Nac. Cordoba 17: 90. 1930; Houard, Zoocéd. Pl. Amer. Sud 350, fig. 814—818 b—f. 1933; Parodi, Rev. Argent. Agron. 1: 201. 1934; Latzina, Trab. Inst. Bot. & Farm. Buenos Aires 54: 112. 1935; Troncoso, Darwiniana 3: 52. 1937; Latzina, Lilloa 1: 189. 1937; Monticelli, Lilloa 3: 357. 1938; Moldenke, Premin. Alph. List Invalid Names 31. 1940; Moldenke, Suppl. List Common Names 17. 1940; Moldenke, Lilloa 5: 429—431. 1940; Moldenke, Suppl. List Invalid Names 5 & 6. 1941; Moldenke, Known Geograph. Distrib. Verbenac., [ed. 1], 35, 42, 43, 73, 95, & 96. 1942; Moldenke, Alph. List Invalid Names 30—32. 1942; Moldenke, Lilloa 8: 426—427 (1942) and 10: 343—344 & 380. 1944; Covas & Schnack, Darwiniana 7: 86. 1945; P. I. Acuña, Catalog. Fl. Catamarq. 17. 1945; Moldenke, Phytologia 2: 85 & 107. 1945; Moldenke, Alph. List Cit. 1: 73, 95, 96, 124, 241, & 266. 1946; Moldenke, Lilloa 12: 148 & 149. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 14. 1947; Lorentz, Veg. Nordeste Prov. Entre Rios, ed. 2, 150. 1947; Cozzo, Revist. Argent. Agron. 14: 252. 1947; Moldenke, Phytologia 2: 338 (1947) and 2: 481. 1948; Moldenke, Lilloa 14: 47—48. 1948; Moldenke, Alph. List Cit. 2: 355, 368, 369, 373, 376—378, 380, 381, 383, 426, 440—442, 535, 537, 574, 585, 593, 598, 600, & 627 (1948), 3: 662, 672, 673, 691, 732—735, 746, 766, 804, 838, 859, 861, 863, 864, 880, 896, 909, 912, & 913 (1949), and 4: 1077, 1088, 1089, 1091, 1092, 1115, 1148, 1214, & 1302. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 73, 101, 105, 162, 189, & 191. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 10. 1949; Moldenke, Phytologia 3: 304 & 305. 1950; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 45. 1951; Troncoso, Darwiniana 10: 80—83. 1952; Moldenke, Phytologia 5: 96. 1954; Acevedo de Vargas, Biol. Abstr. 28: 904. 1954; Hocking, Dict. Terms Pharmacog. 165. 1955; Moldenke, Résumé 84, 121, 126, 220, 310, 312, 314, 316, & 463. 1959; Muñoz Pizarro, Espec. Plant. Descr. Philippi 110. 1960; Moldenke, Résumé Suppl. 10: 4 & 6 (1964), 11: 5 & 7 (1964), and 12: 5. 1965; Moldenke, Biol. Abstr. 46: 3246. 1965; Moldenke, Phytologia 12: 26, 47, 61, 63, 196, 218, 219, & 288. 1965.

Illustrations: Tavares, Broter. Zool. 13: 97—98, pl. 3, fig. 1—5. 1915; Sanzin, Anal. Soc. Cient. Argent. Buenos Aires 88 (i—iv): 102. 1919; Houard, Zoocéd. Pl. Amer. Sud 350, fig. 814—818

b—f. 1933.

Shrub, 0,4—2 m. tall, canescent or glabrous, much-branched, very aromatic; branches erect, virgate, terete or obscurely tetragonal, 23—30 cm. long, often about 2 mm. in diameter, subglabrate, sometimes crowded at the apex of a very short woody stem to 5 mm. in diameter; internodes 3—4 times as long as the leaves; leaves mostly ternate, sometimes decussate-opposite, very aromatic, caducous; petioles short; leaf-blades erect or reflexed, lanceolate or oblanceolate, 1.8—2 cm. long, 5—6 mm. wide, acute at the apex, appressed crenate-serrate along the margins, sometimes entire below and with about 3 teeth per side above, narrowed and attenuate into the petiole at the base, penninerved, strigillose, the setose hairs near and on the margins with a tubercle or broad white scale at the base, flat and lineate above, glandular-roughened beneath, the venation prominent or very prominent beneath, impressed (often deeply) above; inflorescence axillary, short, abundant, single in each axil, subequaling or slightly shorter than the subtending leaves or only 1/4 to 1/3 as long, subinvolucrate; peduncles equaling the heads in length, very shortly appressed-pubescent; heads subglobose, 5—7 mm. wide; bractlets rhombic-subrotund or broadly ovate to obovate, flat, acuminate or long-acuminate at the apex, closely imbricate, strigose-puberulent, equaling or surpassing the corolla-tube, the lower ones 3—4 mm. long and 2 mm. wide; flowers very fragrant; calyx diphyllous, the sepals ovate-lanceolate, hispid with spreading setae, keeled, the keel lanate-ciliate; corolla small, hypocrateriform, violet, lilac, or wine-color to purplish-white, white-lilac, or white, about 5 mm. long, the tube about twice as long as the calyx, the limb regular, 2.5 mm. wide.

The type of this common species was collected by Paul Günther Lorentz (no. 86) at Estancia Germania, near Córdoba, Córdoba, Argentina, between June and September, 1874, and is deposited in the herbarium of the Botanisches Museum at Munich, where it was photographed by Macbride as his type photograph number 20336. The type of L. aprica was collected by Ezechiel Allende in either Tacna, Chile or Peru ["Ab orn. Ezechiel Allende e provinciis borealibus chilensibus vel et australi peruviae allata"] and is deposited as sheet number 54813 in the herbarium of the National Museum of Chile. The type of L. disepala was collected by August Figueroa in the Andes of Jorquera, Atacama, Chile, sent to Philippi by Manuel Serrazzi, and deposited as sheet number 54814 in the herbarium of the National Museum of Chile. The type of L. globiflora var. microphylla f. glabriuscula was collected by Paul Günther Lorentz and Georg Hans Emmo Wolfgang Hieronymus (no. 373) at La Florida, along the Río de la Tala, Catamarca, Argentina, on February 3, 1873, and is deposited in the Britton Herbarium at the New York Botanical Garden.

Philippi (1895) says for his L. disepala: "Parece que las dos cocas del fruto no se separan en la madurez, pero no tanto frutos bien maduros. — ¿Seria acaso la L. asperifolia Rich., planta comun cerca de Córdoba, i en varias partes del mundo? La muestra

difiere de la descripcion de esta especie dada por Schauer....por sus tallos lisos, no erizados, los pedúnculos bastante gruesos, no filiformes, las cabezuelas, que no muestran apariencia de hacerse cilíndricas-ovóideas, las brácteas casi lampiñas, i el cáliz; pero Schauer no dice nada de este órgano." He also says (1896) for his L. aprica: "Tenemos tambien un densísimo cesped de ramos nuevos del largo de 13 milímetros, que necen de un cortísimo tronco leñoso del grueso de 5 milímetros, i que no presentan traza de querer florecer."

The length of pistil in relation to the size of the pollen in this species is discussed by Covas & Schnack (1945). H. H. Bartlett 20181 has its leaves quite narrow and may actually represent f. angustifolia Osten. The flowers are described as "violet" on Venturi 609 & 4292; "lilac" on Cuezzo 25; "purplish-white" on T. Meyer 3735; "white-lilac" on Cuezzo 978; "white and wine-color" on Monetti 143; and "white" on Brizuela 581, I. M. Johnston 4987, T. Meyer 4190 & 4235, Ruíz Huidobro 3043, Schreiter s.n., A. G. Schulz 2891, Sparre 1198, Terribile 647, and Venturi 2361 & 8120. Houard (1933) describes insect galls produced on this plant by two unidentified species of cecidomyids.

Lippia turbinata has been found growing on hard dry ground, dry cultivated ground, uncultivated land, campos, dry barren semi-deserts, hillsides and low hills, river playas, llanuras, in hedges and dry hedges, dry brushwood, dry river valleys, and woods along rivers, at the edges of rivers, and along streams and roadsides, at altitudes of from 70 to 2500 meters, flowering from October to June, and fruiting from November to March. Jörgensen refers to it as "abundant" in Catamarca, Hunziker calls it "frequent" in Salta, while Schulz reports it "abundant in fertile soil in valley" in the same province. Villafañe refers to it as "arbusto coposo" in Córdoba, while Johnston says "local in dryish meadows" in Atacama. Vernacular names reported for it are "Argentine pennyroyal", "poleho", "poleo", "poles", "polio", "té del pais", and "té del país". Di Lullo and Meyer both aver that it is a medicinal plant. Parodi (1934) says "Arbusto achaparrado, de hojas muy aromáticas y caducas, originario de las sierras de Córdoba. Su fama de planta medicinal y la facilidad de multiplicarse por gajos y semillas, ha permitido la difusión de su cultivo, aunque en escasa proporción, por los amantes de la medicina casera." Troncoso (1937) says "La he visto escasamente cultivada en algunos jardines. La infusión de sus hojas es ùtilizada medicinalmente. Originaria de las sierras de Córdoba. Bs. Aires: no. 83 (ex. cult. in Hort. Bot. Fac. Agr. Bs, As.)." Monticelli (1938) says "se la cultiva en muchas partes, aun en Buenos Ayres."

In the Instituto Miguel Lillo the original bibliographic references for L. aprica and L. disepala are given as "Philippi, Plantas nuevas (1896) 416 & 622" — both references are sometimes cited as "1895", sometimes as "1896". The Latzina reference is written as "Latzina, Index II (1937) 189", the Sanzin reference as "Sanzin, Verbenáceae (1919) 102", and the Cozzo reference as "Cozzo, Raices

gemiferas (1947) 252."

Material has been misidentified and distributed in herbaria under the names L. alba (Mill.) N. E. Br., L. asperifolia Rich., L. geminata Kunth, L. geminata var. microphylla Griseb., and L. nodiflora Michx.

On the other hand, the Galander s.n. [Córdoba, 2.I.1880], Hieronymus s.n. [Río Córdoba, 12.XI.1877], Lorentz s.n. [Córdoba, 2/I/80], T. Meyer 13015, 13329, 13436, & 13549, Ruíz Huidobro s.n. [Barrio Mirador, 19-IV-1944], Scala 201, and Villafañe 681, distributed as L. turbinata, are actually f. angustifolia Osten, while H. H. Bartlett 19678 & 19778, Brizuela 237, 810, & 1217, Herb. Inst. Miguel Lillo 32086, Herb. Mus. Argent. Cienc. Nat. 25/1674 & 23810, Herrero 72, Lorentz & Hieronymus 236, Luna Risso 196, T. Meyer 3495, Monetti s.n. [Leal, Las Lecinas, 28.V.1913], Rodriguez 212, and Venturi 655, 2429, 2683, 3799, 4283, 8115, 8120, 8518, and s.n. [Agua Caliente, 2.IV.1925] are all f. magnifolia Moldenke.

In all, 195 herbarium specimens and 5 mounted photographs, including type or phototype material of all the names involved, have been examined by me.

Citations: CHILE: Atacama: Figueroa s.n. [Herb. Mus. Nac. Chile 54814] (N--photo); I. M. Johnston 4987 (S, W--1497728); Ricardi & Marticorena 3744/132 (Ac); Werdermann 474 (Ca--278556, Gg--123382, S, W--1470923). Tacna: Allende s.n. [Herb. Mus. Nac. Chile 54813] (N--photo). ARGENTINA: Buenos Aires: Hauman s.n. [Sierra de la Ventana, Avril 1908] (Br). Catamarca: Ahumada 64 (N); Brizuela 19 (N), 382 (N), 451 (N, S), 528 (N), 541 (N, Rf), 581 (N), 744 (Au--121215, N), 780 (N, Ok), 880 (N, Ur), 975 (N), 987 (N), 1013 (N, S), 1083 (N, S), 1220 (N), 1252 (N); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 30/604] (N); Hauman s.n. [Herb. Mus. Argent. Cienc. Nat. 23860] (N); Jörgensen 1024 [Herb. Inst. Miguel Lillo 32080; Herb. Osten 11424] (Ca--202220, N, N, Ug, W--704750), s.n. [Andalgalá, Nov. 1916; Herb. Fac. Cienc. Med. Buenos Ayres 1024] (Sp--25782); Lorentz & Hieronymus 373 (N); Moldenke & Moldenke 19732 (Es, Lg, N); Pierotti s.n. [18/2/44] (Ca), s.n. [12-III-1944] (W--1931734); Quintero 65 (N); Villafañe 1147 (N). Chaco: T. Meyer 8759 (N); Ragonese 8 [Herb. Mus. Argent. Cienc. Nat. 13345] (N); A. G. Schulz 1488 (N), 6389 (Z). Córdoba: Balegno 961 (N); H. H. Bartlett 19237, in part (W--1904407), 20181 (Mi, W--1904876); Burkart 20411 (Ca--86378); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 31197] (N); Job 554 (N, N); Kuntze s.n. [Córdoba, XII.1891] (W--701567); Lorentz 86 [Macbride photos 20336] (Br--isotype, Kr--photo of type, N--photo of type, W--photo of type); Nicora 378 (N); O'Donell 4433 (N), 4570 (N, Vi); O'Donell & Rodriguez Vaquero 242 (Ca--166091); Pierotti 5121 (N); Rodrigo 278 (N, S), 2184 (N, N); Sota 1483 (Au--121214), 3166 (Gg--410923);

Sparre 1379 (S); Terribile 647 (N), 692 (N, S); Varela 408 (W—1934177); Villafañe 4 (N, N, St), 69 (N). Entre Ríos: Lorentz s.n. [Concepcion del Uruguay, 1880] (W—1233642). La Rioja: Castellanos s.n. [Olta, Feb. 25, 1940; Herb. Mus. Argent. Cienc. Nat. 33898] (N); Cuezzo 978 (N, Ok, Rf); Gómez s.n. [Herb. Mus. Argent. Cienc. Nat. 28/775] (N); T. Meyer 4190 (Ca—771184, Ca—164777), 4235 (Ca—77199, N, N); Varela 769 (Ca, N). Mendoza: Covas 15046 (N); A. Ruíz s.n. [Herb. Mus. Argent. Cienc. Nat. 23928] (N); Ruíz Leal 1142 (N), 4358 (N), 4490 (N), 6754 (N); Sanzin 1832 [Herb. Osten 12799] (Ug). Salta: Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 14814] (N); Correa 5 [Herb. Inst. Miguel Lillo 37041] (Au, Ca—155116, N); Garolera & Romero s.n. [Cuesta del Obispo, 21-I-1947] (N); Hunziker 978 (W—1804058); Lorentz & Hieronymus 373 (W—2815144); Lourteig 1031 (N); Malvarez 176 (N); T. Meyer 3048 (N), 3447 [Herb. Inst. Miguel Lillo 17335] (N), 3448 [Herb. Inst. Migiel Lillo 35570] (En), 3453 [Herb. Inst. Miguel Lillo 35571] (N), 3726 [Herb. Inst. Miguel Lillo 35473] (N), 3735 [Herb. Inst. Miguel Lillo 35482] (Ca—882510, N), 12409 (N, S); Moldenke & Moldenke 19738 (Es, Lg, N, Sm); O'Donell 2514 (Ca—165621), 2548 (Ca—164813); Ruíz Huidobro 513 (W—1934085); A. G. Schulz 1449 (N), 2891 (N); Sota 162 (N); Sparre 1198 (S, S); Wall & Sparre s.n. [near Salta, 4/12/46] (Ew, Ew, Ew). San Juan: H. H. Bartlett 19557 (Ca—772029, Mi, N, W—1904563); Castellanos 15205 (W—2198243); Cuezzo 1845 (N). San Luís: Bruch & Carette s.n. [Alto Pencoso, II.1914] (N, N, N); Digilio & Grassi 2017 (N); Ruíz Leal 9104 (N); Varela 715 (N); Yepes s.n. [Herb. Mus. Argent. Cienc. Nat. 29/90] (N). Santiago del Estero: Balegno 55 (Ca—165673, N); Di Lullo 74 [Herb. Inst. Miguel Lillo 110149] (N, W—1934387); P. Garcia 958 (Ca); Lillo 6182 [Herb. Inst. Miguel Lillo 32088] (N); F. Luna 20 (N), 31 (S); Pierotti 8 (N); Ruíz Huidobro 3043 (N, S). Tucumán: Cuezzo 25 (S); Lillo 18826 [Herb. Inst. Miguel Lillo 32077] (N); T. Meyer 3093 (N); Monetti 143 [Herb. Osten 10875] (Ug), 1949 [Herb. Inst. Miguel Lillo 32090] (N, Vi); Peirano s.n. [El Nio, April 29, 1937; Herb. Inst. Miguel Lillo 32831] (N); Rambo 47544 (Rb); D. Rodriguez 1183 [Herb. Inst. Miguel Lillo 32095] (N, N); Schreiter 7962 [Herb. Inst. Miguel Lillo 32616] (N), s.n. [Amaicha, Dec. 1917; Herb. Osten 12190] (Ug), s.n. [Gualinchey to Mal Paso, Dec. 1917; Herb. Osten 12199] (Ug); Sparre 784 (S); Venturi 609 (W—1591226), 1034 (N), 2361 [Herb. Osten 17265] (N, Ug, W—1591253), 4292 (N, N, S, Ug, W—1591439), s.n. [Herb. Mus. Argent. Cienc. Nat. 23813] (N); E. Wall 10 (Ew); Wall & Sparre s.n. [Trancas, 19/11/46] (Ew, Ew, Ew, Ew, Ew, Ew). CULTIVATED: Argentina: Lanfranchi 704 (N, N). LOCALITY OF COLLECTION UNDETERMINED: Née 93 [Taboga] (Q).

LIPPIA TURBINATA f. ANGUSTIFOLIA Osten ex Moldenke, Lilloa 5: 431. 1940.

Bibliography: Moldenke, Lilloa 5: 431 (1940) and 8: 427. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 43 & 96. 1942; Moldenke, Lilloa 10: 344. 1944; Moldenke, Phytologia 2: 82 & 107. 1945; Moldenke, Alph. List Cit. 1: 95 & 145. 1946; Moldenke, Lilloa 14: 48. 1948; Moldenke, Phytologia 2: 481. 1948; Moldenke, Alph. List Cit. 2: 377, 441, & 537 (1948), 3: 673, 745, 909, & 913 (1949), and 4: 1294. 1949; Moldenke, Phytologia 3: 76. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 105 & 191. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 10. 1949; Ragonese, Revist. Invest. Agric. 5: 72, 83, 85, & 203 (1951) and 6: 70, 75, & 83. 1951; Moldenke, Inform. Mold. Set 51 Spec. 3. 1956; Moldenke, Résumé 126, 425, & 463. 1959; Moldenke, Résumé Suppl. 1: 7 (1959) and 11: 5 & 7. 1964.

This form differs from the typical form of the species in its uniformly very narrow leaves, which, including the petiole, are 1—3 cm. long and only 1—4 mm. wide.

The type of the form was collected by Augusto Gustavo Schulz (no. 1489) in cultivation at Colonia Benítez, Chaco, Argentina, in October, 1933, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector notes that the plant is medicinal, used in the treatment of stomach troubles and to aid digestion.

Ragonese (1951) describes it as follows: "Arbusto, de hojas opuestas, lanceoladas, estrechas, de 2 a 5 mm de ancho, con el borde aserrado, cubiertas por pelos cortos y rigidos; flores blancas, pequeñas, agrupadas en inflorescencias axilares. A la infusión de las hojas y ramitas de esta especie se le atribuyen propiedades estimulantes y tónicas, siendo muy utilizada en medicina popular. Es originaria de las llamuras y de la región serrana cordobesa." Collectors also describe it as a low shrub or depressed aromatic shrublet or a tree-like shrub to 1.5 m. tall, with white flowers, inhabiting dry fields, streambanks, the edges of arroyos, and fencerows at 390 to 1000 meters altitude, flowering from October to May, and fruiting in December and January. Common names reported for it are "poleo" and "poleo crespo". Hunziker refers to it as "common" in Córdoba, and Hieronymus says "häufig bei Córdoba". Meyer reports it as adventive in alfalfa fields, and notes that it is cultivated for its stomachic properties in the Chaco. The corollas are described as "white" on Cuezzo 930, Lossen 221, Luna 31, Ragonese 6241, and Villafañe 181, 489, 611, & 717.

Material has been misidentified and distributed in herbaria as typical L. turbinata Griseb. and under the name Lippia nodiflora Rich.

In all, 76 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: CHILE: Atacama: Ricardi & Marticorena 3645/33 (Ac); Werdermann 484 (N). ARGENTINA: Chaco: T. Meyer 677 [Herb. Osten 22705] (Ug). Córdoba: Balegno 330 (Ca—166170), 1122 (Au—121213,

N); H. H. Bartlett 19237, in part (Mi), 20112 (Mi); Capitanelli s.n. [Ruíz Leal 15972] (Ss); Castellanos s.n. [Villa Brochero, Nov. 12, 1927; Herb. Mus. Argent. Cienc. Nat. 11672] (N); Cuezzo 930 (N); G. Dawson 78 (N, N); Escalente 37 (W--1987974); Galander s.n. [Córdoba, 2.I.1880] (Br); Gillies s.n. [Province of Cordova] (Lu); Herb. A. Gray s.n. [Cordova, 1872] (C); Herb. Mus. Hist. Nat. Montev. 9604 (Ug); Hieronymus s.n. [Río Córdoba; 12.XI.1877] (Br, N--photo, Sp--25786, Sp, W--281543, W--1177974, Z--photo); J. H. Hunziker 1291 (N); Kuntze s.n. [Córdoba, XII.91] (N); Lorentz s.n. [Córdoba, 2.I.80] (N, W--701568); Lossen 221 (Ba, Vi); T. Meyer 13015 (S), 13329 (S), 13436 (S), 13549 (S); Moldenke & Moldenke 19714 (Es, N); O'Donell 4956 (N); D'Donell & Rodriguez Vaquero 409 (Ca--166101); Osten 13108 (Ug); Pontusi s.n. [Ruíz Leal 16131] (Ss); Ragonese 6241 [Herb. Inst. Bot. Minist. Agr. Nac. 68447] (N); Ragonese & Piccinini 6148 [Herb. Inst. Bot. Minist. Agr. Nac. 69275] (N); M. Ruíz 421 (N); Ruíz Huidobro 255 (Ca, N), 451 (W--1931402), s.n. [Toledo, 17-IV-1944] (N), s.n. [Barrio Mirador, 19-IV-1944] (W--2049637); Ruíz Leal 12218 (Z); Scala 201 (W--1691708), 2001 (N); Villafañe 181 (N), 266 (N), 300 (N), 489 (N), 611 (N), 681 (N), 717 (N), 770 (N); Wall & Sparre s.n. [La Falda, 15/12/46] (Ew). La Rioja: Ruíz Leal 16513 (Rl). Mendoza: Ruíz Leal 7088 (N), 8507 (N), 9047 (N). San Luis: Kurtz 8523 (N); Ruíz Leal 10438 (N). Santa Fé: Balegno 646 (N). Santiago del Estero: Cuezzo 2455 (N, S); M. J. de Luna 31 (N); Luna Risso 69 (N); Pierotti 5 (W--1934017). Tucumán: Balegno 1227 (N, S); O'Donell 4316 (N); Schreiter 7962 [Herb. Inst. Miguel Lillo 32616] (N). CULTIVATED: Argentina: A. G. Schulz 1489 (N--type).

LIPPIA TURBINATA f. MAGNIFOLIA Moldenke, Résumé Suppl. 10: 4, nom. nud. May 2. 1964; Phytologia 10: 172. June 18. 1964.

Synonymy: Lippia fissicalyx Troncoso, Darwiniana 10: 83--86, fig. 6. 1952.

Bibliography: Troncoso, Darwiniana 10: 83--86, fig. 6. 1952; G. Taylor, Ind. Kew. Suppl. 12: 82. 1959; Moldenke, Résumé Suppl. 7: 6 (1963) and 10: 4. 1964; Moldenke, Phytologia 10: 172. 1964; Moldenke, Biol. Abstr. 46: 3246. 1965; Moldenke, Résumé Suppl. 12: 5. 1965.

Illustrations: Troncoso, Darwiniana 10: 85, fig. 6. 1952.

This form differs from the typical form of the species in having its leaves mostly decussate-opposite, the blades regularly larger and wider when mature, to 7 cm. long and 3.3 cm. wide, more broadly elliptic to lanceolate-ovate or oblanceolate to obovate, and the peduncles usually 2 per axil. Collectors describe it as a shrub, to 1.5 m. tall, with corolla varying from white to flesh-color, pinkish-white, lilac, rose, violet, or violet-white.

The type of the form was collected by Santiago Venturi (no. 8120) at an altitude of 1300 meters, Campo Quijaro, Rosario de Ler-

ma, Salta, Argentina, in January, 1929, and is deposited in the United States National Herbarium at Washington. The type of L. fissicalyx was collected by Venturi (no. 8115) at the same locality on January 19, 1929, and is deposited in the herbarium of the Instituto Botanico Darwinion at San Isidro, Argentina.

The plant has been found growing in dry uncultivated or arid hard dry soil, on campos, and along riverbanks, at altitudes of 270 to 1450 meters, flowering from November to May, and fruiting in December and from March to May. The only common name recorded for it is "poleo". The flowers are described as "violet" on Venturi 655; "rose" on Venturi 4288; "violet-white" on Venturi 2429; "lilac" on Herrero 72 and Venturi 8115; "flesh-color" or "pinkish-white" on Lorentz & Hieronymus 236; and "white" on H. H. Bartlett 19778, T. Meyer 3495, and Venturi 2683, 3799, & 8518.

Troncoso (1952) describes this plant as follows: shrub, 1--2 m. tall, branched; branches subtetragonal, yellowish-brown, subglabrous; branchlets small, tetragonal, striate, pubescent; middle internodes 3--4 cm. long, on floriferous branches to 5.5 cm. long; leaves decussate-opposite, rarely ternate, oval or sometimes obovate, 1--4.5 cm. long (including the petiole), 0.5--1.7 cm. wide, usually acute at the apex, cuneate at the base, somewhat bicolored, regularly dentate on the upper 2/3, entire at the base, with short appressed hairs above more or less regularly distributed on the lamina (the hairs callose at the base, especially those toward the leaf-margins), incanous-pubescent and finely reticulate beneath with the hairs larger along the venation, densely glandular punctate among the pubescence; venation deeply impressed above, especially toward the margins and in the teeth, prominent beneath; peduncles 1 or more usually 2 per axil, 3--6 mm. long, pubescent; heads hemispheric, 5--6 mm. wide; bractlets in many series, the lower ones larger, firm, oval-lanceolate, 3--4.5 mm. long, 1--1.8 mm. wide, 3-veined, pubescent, the upper ones oval, concave, 1.8--2 mm. long, 1.7--2 mm. wide, short-apiculate, pubescent, ciliate-margined, glandular-punctate; calyx in bud 2-lobed, the anterior side split to the base ["y hendido de un lado casi hasta la base, hendidura del lado externo, unido sólo en la cara superior"], during anthesis separating so that in fruit it is diphyllous, the two parts distinct, concave, carinate, and hirsute especially on the keel; corolla small, tubular, 3.5--4 mm. long, bilabiate, the lower lip 3-lobed, the middle lobe developed, the upper reduced and 2-lobed, the tube about 3 mm. long, gently dilated toward the top, pubescent and glandular-punctate on the upper portion; stamens 4, didynamous, inserted in the upper half of the corolla-tube, included; ovary oval, glabrous; stigma apico-lateral; fruit dry, obovate, smooth, 2 mm. long, 1.8 mm. wide, the pericarp spongy on the upper part and sides, the remainder osseous; seeds obovate.

She comments that "Lippia fissicalyx difiere de Lippia turbinata Gris., la especie más afín, por sus hojas opuestas, rara vez ternadas, por sus capítules generalmente de a 2 por axila; éstos son además semiesféricos, no o muy poco alargados en la fructificación,

nunca turbinados, y por sus hojas más anchas y menos agudas y rigidas. Sin embargo, la existencia de formas de hojas anchas en L. turbinata hace a veces difícil la separación y sugiere la idea de la existencia de hfbridos.

"Por inscripciones en ejemplares del Museo de Córdoba, parece evidente que Grisebach consideró esta nueva especie como Lippia geminata var. microphylla, pero también aplicó ese nombre a ejemplares latifolios de Lippia turbinata. Es poco probable, sin embargo, que se trata de dicha variedad por haberse descrito ésta originariamente de Cuba, México y Perú (Grisebach, Fl. Brit. West Ind. Isl., p. 495, 1864), aunque el mismo autor más tarde la cita para Tucumán y Salta (Gris., Symb., p. 278, 1879). Lippia fissicalyx, en todo caso, es vecina de Lippia turbinata y no de Lippia geminata HBK. Por otre parte para la nomenclatura, si se confirma esta sinonomie, la variedad no tiene mayor interés; como ya existe una L. microphylla Cham. (1832), no era posible elevar la variedad de Grisebach al rango de especie." She cites also from Salta Lorentz & Hieronymus 236 (Cd) & s.n. [San José, II.1873] (Cd) and Vattuone 29 (Si), from Jujuy Burkart & Troncoso s.n. [Jujuy, 15. II.1940] (Si--11097), and from Tucumán Lorentz & Hieronymus 1114 (Cd), D. Rodriguez 212 (Si), and Venturi 655 (Si) & 2429 (Si).

Material has been misidentified and distributed in herbaria under the names L. geminata var. microphylla Griseb., L. globiflora var. geminata f. glabriuscula Kuntze, L. poleo Lillo, and L. turbinata Griseb. Venturi 8518 was mistakenly cited by me as L. turbinata in Lilloa 14: 47 and his 655 & 8120 as L. turbinata in my Alph. List Cit.

In all, 42 herbarium specimens, including type material of both names involved, have been examined by me.

Citations: ARGENTINA: Catamarca: Brizuela 237 (N), 810 (N), 1217 (W--2123672); Luna Risso 196 (N). La Rioja: T. Meyer 3495 (N, N, W--1909097). Salta: H. H. Bartlett 19678 (Mi, W--1904616); Herrero 72 (W--2049728); Lorentz & Hieronymus 236 (N, W--281555); Venturi 3799 (W--1591280), 8115 (Gg--166654, W--1443377, W--1591398), 8120 (Gg--166670--isotype, N--isotype, W--1443380--type), s.n. [Agua Caliente, 2.IV.1925; Herb. Mus. Argent. Cienc. Nat. 25/1674] (N). Santiago del Estero: H. H. Bartlett 19778 (Mi, W--1904679). Tucumán: Monetti s.n. [Leal, Las Lecinas, 28.V.1913; Herb. Inst. Miguel Lillo 32086] (N, Ug--11934, W--1802569); D. Rodriguez 212 [Herb. Mus. Argent. Cienc. Nat. 23810; Herb. Inst. Miguel Lillo 32094] (N, N); Venturi 655 [Herb. Inst. Miguel Lillo 32092] (N, W--1591227), 2429 [Herb. Osten 17238] (Gg--151843, Ug, W--1343280, W--1591256), 2683 (W--1591263), 4288 (N, W--1591435), 8518 (E--961964, N, S, W--1591406).

LIPPIA TURNERIFOLIA Cham., Linnaea 7: 217. 1832 [not L. turnerifolia Chod., 1904, nor Hieron., 1947].

Synonymy: Lippia turneraefolia Cham. apud Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 196. 1893 [not L. turneraefolia Chod., 1904]. Lippia turnerifolia α normalis Kuntze, Rev. Gen. Pl. 3 (2): 253. 1898. Lippia turneriifolia Cham. ex Rosengurtt, Estud. Prad. Nat. Urug. 3: 235, sphalm. 1943. Lantana turneraefolia Cham. ex Moldenke, Alph. List Invalid Names Suppl. 1: 13, in syn. 1947. Lippia turnerifolia Cham. & Schlecht. ex Moldenke, Alph. List Invalid Names Suppl. 1: 15, in syn. 1947. Lippia turnerfolia Cham. ex Moldenke, Résumé Suppl. 12: 11, in syn. 1965. Lippia turnerifolia var. normalis Kuntze ex Moldenke, Résumé Suppl. 12: 11, in syn. 1965.

Bibliography: Cham., Linnaea 7: 217. 1832; Steud., Nom. Bot., ed. 2, 2: 54. 1840; D. Dietr., Syn. Pl. 3: 597. 1843; Walp., Repert. Bot. Syst. 4: 45. 1845; Schau. in A. DC., Prodr. 11: 581—582. 1847; Schau. in Mart., Fl. Bras. 9: 233. 1851; Lorentz, Veg. Nordeste Prov. Entre Ríos, ed. 1, 122 & 150. 1878; Griseb., Abhand. Kaiser. Gesell. Wiss. Götting. 24: [Symb. Fl. Argent.] 277. 1879; Lillo, Fl. Tucuman 94. 1888; Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 196. 1892; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 96. 1894; Kuntze, Rev. Gen. Pl. 3 (2): 253 & 315. 1898; Chod., Bull. Herb. Boiss., sér. 2, 2: 820. 1904; Chod., Pl. Hassler. 1 (9): 199. 1902; Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1158 & 1159. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 493 & 494. 1904; Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 311. 1904; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 541. 1911; Herter, Florul. Urug. 105. 1930; Moldenke in Fedde, Repert. Nov. Sp. 39: 146. 1936; Herter, Revist. Sudam. Bot. 4: 185—186. 1937; Gallinal, Bergalli, Campal, Aragone, & Rosengurtt, Stud. Nat. Mead. Urug. 81. 1938; Herter, Revist. Sudam. Bot. 6: 97. 1939; Herter, Beih. Bot. Centralbl. 59: 275. 1939; Moldenke, Lilloa 5: 421, 424, & 431—432. 1940; Ragonese, Darwiniana 5: 413. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 38, 40, 41, 43, & 96. 1942; Moldenke, Lilloa 8: 427. 1942; Parodi, Darwiniana 6: 175. 1943; Rosengurtt, Estud. Prad. Nat. Urug. 3: 235. 1943; Moldenke, Lilloa 10: 344 & 381 (1944) and 12: 129. 1946; Moldenke, Alph. List Cit. 1: 28 & 39. 1946; Augusto, Fl. Rio Grande do Sul 221, 223, & 234—235, fig. 105b. 1946; Lorentz, Veg. Nordeste Prov. Entre Ríos, ed. 2, 122 & 150. 1947; Moldenke, Phytologia 2: 244, 385, & 386. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 13 & 15. 1947; Moldenke, Lilloa 14: 40—41, 44, & 48. 1948; Moldenke, Alph. List Cit. 2: 358, 368, 426, 448, 457, 552, 575, 598, & 628 (1948), 3: 695, 781, 798, 911, 921, 922, & 969 (1949), and 4: 1075, 1077, 1166, 1251, & 1256. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81, 97, 99, 100, 105, & 191. 1949; Moldenke, Phytologia 3: 287. 1950; Stellfeld, Trib. Farmac. 19 (10): 169. 1951; Angely, Fl. Paran. 7: 12. 1957; Moldenke, Résumé 94, 114, 117, 119, 126, 308, 318, & 463. 1959; Moldenke, Résumé Suppl. 1: 7. 1959; Angely, Fl. Paran. 16: 60 (1960) and 17: 46. 1961; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Moldenke, Résumé Suppl. 10: 6 (1964),

11: 7 (1964), and 12: 11. 1965; Moldenke, Phytologia 12: 24, 26, 90, 93, 134--136, 294, 347, & 356. 1965; Rambo, Pesquis. Bot. 21: 28 & [59]. 1965.

Illustrations: Augusto, Fl. Rio Grande do Sul fig. 105b. 1946.

Dioecious dense bushy shrublets, usually 0.5--0.8 m. tall, sometimes to 1.3 m. tall, with a creeping rhizome; stems herbaceous or suffruticose, erect, simple, rather terete, hirsute with white rigid spreading hairs, finally calvescent and roughened below; leaves decussate-opposite, varying in size and shape with the stature of the entire plant; petioles short; leaf-blades lanceolate or oblong to obovate, 2--5 cm. long, usually about 1 cm. wide or wider, acute at the apex, crenate-serrate along the margins, entire and cuneate at the base and there narrowed into the petiole, impressed-penninerved above, strigose above with bulbous-based hairs and harshly rough, hirsute on the venation beneath but finally merely strigose there; inflorescence axillary and terminal; peduncles filiform, sometimes short and scarcely 1/3 as long as the subtending leaves, sometimes elongate and surpassing the leaves and stems, hirsute; heads rounded or subglobose, dense, to 1.3 cm. wide, involucrate; bractlets ovate, imbricate, acuminate at the apex, equaling the corolla-tube; flowers very small; corolla hypocrateriform, yellow or light-yellow to deep-yellow, sometimes reddish inside.

The type of this rather puzzling species was collected by Friedrich Sellow in dry grassy places on dry hillsides near the town of São Lucia, Rio Grande do Sul, Brazil, on September 17, 1828, and is deposited in the herbarium of the Naturhistorisches Museum at Vienna, where it was photographed by Macbride as his type photograph number 34333. The species has been found growing on campos, rocky or dry grassy campos, dry hills, and rocky grassy slopes, in forests and quebradas, rocky places, and rocky fields on mountainsides, and at the edges of woods, at altitudes of 400 to 2000 meters, flowering from August to March. Balls found it on "steep slopes in heavy clay soil amongst undergrowth and trees, usually on the edge of thickets". Rosengurtt calls it "frequent" in Uruguay, Hunziker refers to it as "rare" in Salta, while Parodi (1943) says "común en praderas humédas" in Corrientes.

Briquet (1904) says "Cette espèce est extrêmement rapprochée de la précedente [L. asperrima], dont elle se distingue cependant par ses pedoncules plus courts, nullement glanduleux-visqueux, mais rendus hirsutes par de longs poils raides étalés ou subascendants très denses."

The flowers are described as "light-yellow" on T. Rojas 377, "deep-yellow" on Balls 5931, "yellow, reddish inside" on T. Rojas 280a, and "yellow" on Bertoni 1943, Herb. Inst. Bot. S. Paulo 23037, 23346, & 36735, F. C. Hoehne s.n., Hoehne & Gehrt s.n., Hunziker 1247, Job 1543, T. Meyer 3452, Osten 4358 & 9181, Rambo 28436, T. Rojas 441, A. G. Schulz 6983, Sleumer & Vervoorst 2778, Stellfeld 1039, and Venturi 7359.

It should be noted here that the L. turnerifolia of Hieronymus, referred to in the synonymy above, is a synonym of Lantana aristata var. angustifolia (Kuntze) Moldenke and that of Chodat is Lippia tristis Briq., L. turnerifolia var. camporum Griseb. is L. contermina Briq., and L. turneraefolia Chod. is L. tristis Briq.

Schauer (1847) places the species in his Section Zapania and Subsection Axilliflorae. Material has been misidentified and distributed in herbaria under the names L. asperrima Cham., L. trachyphylla Briq., L. turnerifolia var. angusta Kuntze, and Lantana sp. On the other hand, the Herb. Inst. Miguel Lillo 32176, 35569, & 37994, Herb. Mus. Argent. Cienc. Nat. 26/1342, Herb. Osten 17237 & 22239, Job 1543, Jörgensen 3775, Kuntze s.n. [Jujuy, Oct. 1892], Malme s.n. [Las Palmaso, 20/3/1903], T. Meyer 3452, Monetti 1138, T. Roig 15427, Rosengurtt B.3002, Schreiter s.n. [Muñecas, Dec. 16, 1923] & s.n. [Cerro San Lorenzo, Oct. 18, 1925], and Venturi 531, 2432, 2627, & 3614, distributed as L. turnerifolia, are L. asperrima Cham.; Gallinal, Aragone, Bergalli, Campal, & Rosengurtt 1616, Herb. Herter 50765, Herb. Osten 22703, Herter 2033a, T. Meyer 113, and A. G. Schulz 1499 are L. asperrima var. longepedunculata Moldenke; Herb. Inst. Miguel Lillo 32167 and Venturi 1375 are L. contermina Briq.; Herb. Inst. Bot. S. Paulo 36448 and Archer & Gehrt 91 are L. longepedunculata Kuntze; Herb. Herter 82594, Herter 989, Malme 2791, and Morong 575 are L. morongii Kuntze; Kuntze s.n. [Tunari, V.92] is L. trachyphylla Briq.; Legrand 3489 is L. villafloridana Kuntze; and Regnell 1088 and Widgren 1088 are Lantana glaziovii Moldenke. The Jönsson 35a cited by me in Phytologia 12: 90 (1965) as L. asperrima is actually L. turnerifolia.

Schauer (1851) cites a Riedel s.n. from Rio Grande do Sul, while Ragonese (1941) cites his no. 2808 from Santa Fé. Glaziou (1911) cites his no. 21890, but this is actually Casselia glaziovii (Briq. & Moldenke) Moldenke.

In all, 54 herbarium specimens and 5 mounted photographs, including type material of all the names involved, have been examined by me.

Citations: BRAZIL: Paraná: Dombrowski, Saito, & Pereira 947/771/290 (Ac); Dusén 2306 (Ja--34918), s.n. [Jaguariahyva, 24.10.1910] (S), s.n. [Tamandua, 24.11.1910] (S); H. M. Filho 50 [Herb. Mus. Paran. 5319; Herb. Curso Farmac. 714] (S); Hatschbach 1006 (N), 3755 (Z); F. C. Hoehne s.n. [Curitiba, Oct. 18, 1928] (N, Sp--23037), s.n. [Vila Velha, Ponta Grossa, Nov. 3, 1928; Herb. Inst. Bot. S. Paulo 23346, in part] (N); Jönsson 35a (Ca--501674, Ca--533217, Mp, N, S, S, W--1481949); Stellfeld 26 (Mp--1395), 1039 [Herb. Mus. Paran. 2019] (N); Tessmann s.n. [17-10-47; Herb. Mus. Paran. 2508] (N). Rio Grande do Sul: Rambo 28436 (Rb); Sel-

low s.n. [Brasilia, 17.9.1828; Macbride photos 34333] (Br--isotype, It--photo of type, Kr--photo of type, N--isotype, N--photo of type, N--photo of isotype, Vt--isotype, Z--photo of isotype). Santa Catarina: Castellanos 24724 (Ac); Dusén 17928 (S); Smith & Klein 11592 (W--2249378), 11599 (W--2249379); Smith, Reitz, & Caldato 9535 (Ok). São Paulo: Hoehne & Gehrt s.n. [Iperó, Nov. 10, 1936] (Sp--36735). BOLIVIA: Chuquisaca: Troll 60 (B). PARAGUAY: Hassler 9312 (N); Osten 9181 (S, Ug); T. Rojas 280a [Herb. Osten 7909] (N, Ug), 377 [Herb. Osten 7901] (Ug), 441 [Herb. Osten 7903] (Ug). URUGUAY: Arechavaleta s.n. [vicinity of Salto, Nov. 1898; Herb. Osten 3755] (Ug); Herb. Herter 83831 (N); A. Lutz 1653 (Lz); Osten 3104 (Ug), 4358 (Ug); Schröder s.n. [Paysandu, Nov. 1921; Herb. Osten 16350] (Ug). ARGENTINA: Corrientes: Parodi 12386 (N). Jujuy: Balls 5931 (W--1777760). Misiones: Bertoni 1943 (N); Ekman 1998 (S); Rosa Medina 55 (N, S); A. G. Schulz 6983 (Sz). Salta: Hunziker 1247 (W--1804110); Sleumer & Vervoorst 2778 (W--2173213). Tucumán: Venturi 7359 (E--962384).

LIPPIA TURNERIFOLIA var. ANGUSTA Kuntze, Rev. Gen. Pl. 3 (2): 253 [as "β angusta"]. 1898.

Bibliography: Kuntze, Rev. Gen. Pl. 3 (2): 253. 1898; Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 311 & 315. 1904; Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1158. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 494. 1904; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 38, 41, & 96. 1942; Moldenke, Alph. List Cit. 1: 262 (1946) and 2: 370, 553, & 628. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81, 99, & 191. 1949; Moldenke, Phytologia 3: 287. 1950; Moldenke, Résumé 117 & 463. 1959; Moldenke, Phytologia 12: 294. 1965; Rambo, Pesquis. Bot. 21: 28. 1965.

This variety differs from the typical form of the species in having its leaf-blades 3--5 cm. long, but only 1 cm. or less in width.

The type of the variety was collected by Carl Ernst Otto Kuntze in southern Paraguay in September, 1892, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is not a well-marked variety. Briquet (1904) in speaking of his L. morongii says "Le L. Morongii ressemble beaucoup dans ses formes réduites au L. turnerifolia β angusta, quoique le plus souvent son port plus robuste et ses feuilles moins rugueuses le fassent facilement reconnaître. Il s'en distingué essentiellement par l'absence de poils allongés et ± étalés, exclusivement remplacés par des poils strigueux ascendants et courts: en outre, les bractéoles extérieures des capitules sont largement ovées-acuminées." He also cites a Hassler 10366, from prairies at Itape, collected on September 9, 1874, with yellow flowers. The Hoehne & Gehrt s.n. [Iperó, Nov. 10, 1936; Herb. Inst. Bot. S. Paulo 36735], distributed as this variety, seems to represent the typical form of L. turnerifolia instead.

In all, 3 herbarium specimens, including the type, of this variety have been examined by me.

Citations: PARAGUAY: Hassler 308 (Bm, N); Kuntze s.n. [Std Paraguay, IX.92] (N--type).

LIPPIA TURNERIFOLIA var. SESSILIFOLIA Moldenke, Phytologia 3: 376, nom. mud. 1950; Lloydia 13: 224 [as "turnerfolia var. sessilifolia"]. 1951.

Bibliography: Moldenke, Phytologia 3: 376. 1950; Moldenke, Lloydia 13: 224. 1951; Moldenke, Résumé 94 & 463. 1959; Rambo, Pesquis. Bot. 21: 28. 1965.

This variety differs from the typical form of the species in having its leaves sessile, oblong-elliptic, 2--4 cm. long, and 6--9 mm. wide.

The type of the variety was collected by Padre Balduino Rambo (no. 28180) in shrubby fields at Nonoai on the central Rio Uruguay, Rio Grande do Sul, Brazil, on March 3, 1945, and is deposited in the herbarium of the Colegio Anchieta at Porto Alegre, Brazil. Rambo (1965) cites his collections as Herb. Anchieta 28180 & 28436 from Rio Grande do Sul. He describes the plant as a "Small shrub, 50 cm. high", growing on "Dry, more or less open or shrubby Campos" -- known to him only from the one locality, Nonoai on the Uruguay river. He gives the general distribution of the species, however, as "From Paraná to RGS; from Paraguay to northern Argentina and Uruguay". The taxon is known to me thus far only from the original collection, of which I have examined the type and 4 phototypes.

Citations: BRAZIL: Rio Grande do Sul: Rambo 28180 (E--photo of type, F--photo of type, N--photo of type, Rb--type, Z--photo of type).

LIPPIA UKAMBENSIS Vatke, Linnaea 43: 528--529 [as "L.? ukambensis"]. 1882.

Bibliography: Vatke, Linnaea 43: 528--529. 1882; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 96. 1894; Gürke in Engl., Pfl. Ost-Afr. C: 338. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 281. 1900; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50 & 96 (1942) and [ed. 2], 118 & 191. 1949; Moldenke, Résumé 145, 146, & 463. 1959; Moldenke, Phytologia 12: 42, 106, 230, 307, 352, & 431 (1965) and 12: 483. 1966.

Shrub or subshrub, 0.6--3 m. tall; stems pithy, branched; sap colorless; branchlets hispid, villous upwards; leaves decussate-opposite, stiff, dry; petioles short; leaf-blades ovate- or oblong-lanceolate, to 5 cm. long, crenate along the margins, attenuate at the base, hispid on both surfaces, rough; heads solitary in the leaf-axils, short-pedunculate, subglobose to finally oblong, about 1.3 cm. long; bractlets oblong, longer than the corolla-tube, acuminate at the apex; flowers with the odor of carnation (Dianthus caryophyllus L.); calyx green; corolla hypocrateriform, white or cream-colored to lemon-yellow with a darker center; anthers yellow.

The type of this species was collected by Johann Maria Hildebrandt (no. 2739) at Kitui, Ukamba, Kenya. The flowers are described as

"white" on A. Peter 42280 & 46706, "lemon-yellow with darker center" on Tanner R.T.849, and "calyx green, corolla cream, anthers yellow" on Drummond & Hemsley 2245.

The species has been found growing in secondary bushland, in grass on hillsides, and on grass steppes, at altitudes of 800 to 1880 meters, flowering in January, February, April, July, and August. Material has been misidentified and distributed in herbaria under the name L. asperifolia A. Rich.

The Greenway 3116 and A. Peter 11244, distributed as L. ukambensis, appear to be L. schliebeni Moldenke. The G. F. S. Elliot 6331 collection, judging from the photograph cited below, greatly resembles L. schliebeni. It is possible that L. schliebeni and L. ukambensis are actually conspecific. A. Peter 1715, 43360a, 43525, & 46706 have very scabrous leaves, while his 46807 has some of the leaves scabrous and some not scabrous!

In all, 12 herbarium specimens and 1 mounted photograph have been examined by me.

Citations: TANGANYIKA: Drummond& Hemsley 2245 (B, S, Z); A. Peter 1682 [O. I.41] (B), 1715 [O.I.42] (B), 42280 [V.283] (B), 43360a [V.306] (B), 43525 [V.313] (B), 46087 [V.139] (B, Z), 46706 [V.283] (B); Tanner R.T.849 (Ca—182991). KENYA: G. F. S. Elliot 6331 (N--photo).

LIPPIA UMBELLATA Cav., Icon. 2: 75, pl. 194. 1793.

Synonymy: Lantana scabra Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 29, in syn. 1940. Lippia parviflora Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 32, in syn. 1940 [not L. parviflora Gardner, 1947].

Bibliography: Cav., Icon. 2: 75, pl. 194. 1793; Spreng. in L., Syst. Veg., ed. 16, 2: 753. 1825; Steud., Nom. Bot., ed. 2, 2: 54. 1840; D. Dietr., Syn. Pl. 3: 599. 1843; Walp., Repert. Bot. Syst. 4: 54—55. 1845; Schau. in A. DC., Prodr. 11: 591. 1847; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 96. 1894; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 151. 1895; Greenm., Field Mus. Publ. Bot. 2: 341. 1912; Gandoger, Bull. Soc. Bot. France 65: 63. 1918; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1244, 1246, & 1247. 1924; Anon., Salvador Minist. Instrucc. Publ. Fl. Salvad. 2: pl. 76. 1926; A. B. Seymour, Host Ind. Fungi N. Am. 588. 1929; P. C. Standl., Field Mus. Publ. Bot. 3: 402—403. 1930; Stapf, Ind. Lond. 4: 125. 1930; H. B. Davis, Life & Works Pringle 97. 1936; P. C. Standl., Field Mus. Publ. Bot. 18: 1010. 1938; Moldenke, Alph. List Common Names 11. 1939; Moldenke, Prelim. Alph. List Invalid Names 29 & 32. 1940; Worsdell, Ind. Lond. Suppl. 2: 58. 1941; Calderón & Standl., Fl. Salvad., ed. 2, 238. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 17 & 96. 1942; Moldenke, Alph. List Invalid Names 29 & 32. 1942; Moldenke, Phytologia 2: 71 & 107. 1945; Moldenke, Alph. List Cit. 1: 28, 148, 152, 242, & 251. 1946; Moldenke, Phytologia 2: 330. 1947; B. P. Reko, Soc. Bot. Mex. Bol. 6: 24. 1948; Moldenke, Alph. List Cit. 2: 393, 467, 468, 470, 491, 539—543, 595,

& 632 (1948), 3: 685, 769, 788, 829, 830, 833, 878, 885, 925, & 926 (1949), and 4: 1073, 1075, 1076, 1180, & 1303. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 10. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 31 & 191. 1949; Moldenke, Spec. Subsp. Cont. Mold. Set 45 p. [2]. 1951; Moldenke, Inform. Mold. Set 46 Spec. 3 (1951), 48 Spec. [3] (1954), and 49 Spec. 2. 1954; Calpouzos, Econom. Bot. 8: 228. 1954; Hocking, Dict. Terms Pharmacog. 128. 1955; Moldenke, Inform. Mold. Set 51 Spec. 3. 1956; Moldenke, Résumé 37, 307, 316, & 463. 1959; Moldenke, Résumé Suppl. 3: 9. 1962; N. L. H. Krauss, Coleop. Bull. 18: 93. 1964; Moldenke, Phytologia 12: 24, 111, 115, 137, 142, 143, 149, 168, 172, 173, 189, 216, 223, 263, 301, 337, 362, & 363 (1965) and 12: 502—504. 1966.

Illustrations: Cav., Icon. 2: pl. 194. 1793; Anon., Salvador Minist. Instrucc. Publ. Fl. Salvad. 2: pl. 76. 1926.

Bush, loose shrub, or small weak round-headed tree, 1—12 m. tall, pleasantly aromatic with the odor of menthol; trunk to 15 cm. in diameter at breast height; stems fruticose, tetragonal; bark gray; wood white; pith central, spongy; branches decussate-opposite, tetragonal, subvillose; leaves decussate-opposite, fragrant, short-petiolate; petioles scarcely 2.5 cm. long, terete, connate; leaf-blades dark-green above, lighter or whitish beneath, narrow-lanceolate to ovate or broadly ovate, 6—20 cm. long, obtuse to attenuate at the apex, acute to rounded at the base, finely or coarsely crenate or serrate along the margins, penninerved, rugose, scabrous or scaberulous above, subtomentose or woolly-tomentose beneath; inflorescences umbellate, in loose rounded cymes to 15 cm. wide, the umbels many, axillary at the apex of the branchlets; primary peduncles almost 4 cm. long, with about 5 rays and a pair of small bracts at the base; flowers congested in heads, the heads very numerous, dense, globular, about 1.3 cm. wide, long-pedunculate, to 2 cm. wide in fruit; bractlets commonly reniform or broadly ovate-cordate, 3 times as long as the flowers, carinate into an acumen at the apex; calyx globose, tomentose, semibifid, the hemispheric segments persistent; corolla hypocrateriform, varying from green- or greenish-yellow, yellow, pale-yellow, deep-yellow, or rich-yellow to dull yellow-cream, fawn, or white, sometimes yellowish and turning red, or deep-yellow with a whitish eye, 2-lipped, the tube conic, as long as the calyx, the throat open, the limb 4-parted, the lobes rounded, subequal, revolute; stamens 4, short, 2 slightly longer than the others; filaments capillary; anthers reddish, ovate; ovary ovate; style simple; stigma globose, subterminal, not emarginate, tomentose; fruit a small capsule, glabrous, covered by the mature calyx-segments, 2-celled, each cell 1-seeded.

The type of this species was collected by Antonio José Cavanilles from cultivated material growing in the botanical garden at Madrid, Spain, flowering and fruiting there at the end of December, grown from seed brought from Mexico two years previous. Cavanilles notes "Linnaeus de Lippia disserens calicem dixit superum, quem Gaertner novissime inferum delineavit tabula 56 ubi Lippiae ameri-

canae fructum descripsit, qui plantae nostrae fructui quadrat, seminibus exceptis quae minime nuda sunt sed capsula biloculari contenta. Linnaeus diversi generis plantas consociavit Lippiae nomine, quas Gaertner reduxit ad Daleam et Lippiam; ex Lippia ovata illud, istud ex Americana. Huic ergo fructicem adiungo Phrymae nomine in laudatum hortum introductum."

It should be noted here that the L. parviflora of Gardner, mentioned in the synonymy above, is a synonym of L. gracilis Schau. The Langlassé 744, cited below from Guerrero, may have been collected in Michoacán -- the locality given on the label is "Moreno".

Schauer (1847) places L. umbellata in his Section Rhodolippia, Subsection A; Briquet (1895) classifies it in Subgenus Zapania, Section Rhodolippia. Walpers (1845) reduces L. callicarpaefolia H.B.K. to this species, but this is entirely unjustified.

Lippia umbellata has been found growing on hills and mountains, foothills and dry sunny hillsides, in rich loam soil, in woods, oak woods and forests, oak & pine or pine-oak-fir forests, pine & fir forests, the sunny sides of cliffs, in hedgerows at the edge of cultivated land, and on pine-oak-madroño openly forested slopes, at altitudes of 400 to 2850 meters, flowering from September to March and in June, and fruiting from October to March. Calderón & Standley (1941) describe it as "common" in El Salvador; McVaugh says of it in Jalisco "abundant here and at lower elevations", "frequent on steep mountainsides in pine-oak forests (zone of broad-leaved trees in barrancas)", and "occasional on steep slopes in cloud forest of firs and broad-leaved trees"; while McVaugh & Koelz found it on precipitous rocky mountain slopes and ravines of gypsum and slate in deciduous woodland with Juliana, Bursera, Cephalocereus, Cryptocarpa, and Cassia.

Standley (1924) and Hocking (1955) report the herbage used in the treatment of colic in Durango. Krauss (1964) notes that the leaves are mined by the beetle Octotoma scabripennis Guérin, but probably he is referring here to L. hypoleia, since his no. 858, identified by him as L. umbellata, is actually L. hypoleia. Seymour (1929) reports that L. umbellata is attacked by the fungi Puccinia elatipes Arth. & Holw. and Prospodium lippiae (Speg.) Arth. [Puccinia lippiae Speg.]. Common names reported for it are "caragra", "droceria", "drosira", "hierba de la mula", "juanislama de monte", "nacare", "oreganillo", "oregano montes", "orégano montés", "rosa de Castilla", "salvia", "salvia poblana", "seca-leche", "tabaquillo", "topozana", and "xoltenuuc" -- "oreganillo", however, is also applied to L. cardiostegia Benth., L. graveolens H.B.K., and L. myriocephala Schlecht. & Cham.

The flowers are described as "green-yellow or white" on Hinton 11910, "rich-yellow or fawn color" on Hinton 13550, "greenish-yellow" on Hinton 15706, "dull yellow-cream" on Balls 5489, "pale-yellow" on McVaugh 13935, and "yellow" on Hinton 12791, McVaugh & Koelz 1069, and Rowntree 300.

Standley (1930) reduces L. albicaulis Greenm. and L. yucatana Loes. to synonymy under this species, the latter with a question. He says "I have not seen the type of L. yucatana, collected at Chichen Itzá by Seler (no. 4918), and it may be referable rather to L. myriocephala Schlecht. & Cham." In his 1924 publication he reduces L. albicaulis Greenm., L. chiapasensis Loes., L. pringlei Briq., and L. substrigosa Turcz. to L. umbellata, and says "The numerous specimens at hand show considerable variation, especially in pubescence and size of heads, but there do not appear to be any well-marked characters by which it is possible to distinguish the proposed segregates."

Material has been misidentified and distributed in herbaria under the names L. callicarpaefolia H.B.K., L. callicarpaefolia Kunth, L. durangensis Moldenke, and L. involucrata Sessé & Moc.

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BOOK REVIEW

Alma L. Moldenke

"The Chemistry of Plant Processes", by C. P. Whittingham, 209 pp., illustr. Philosophical Library, Inc., New York 16, New York. $7.50

The author's words of intention -- "to introduce students who have some basic knowledge in the physical sciences to problems in plant metabolism" -- can be made fact by careful study of this concise book. The first half deals in a quite effective and up-to-date manner with cellular metabolism -- structure, function, enzymes, fermentation, respiration, biological syntheses, photosynthesis, nitrogen metabolism. The second half deals in a more dated manner with plant processes -- osmosis, water relations, translocation, growth.

At the end of chapters there are short, pertinent bibliographies. At the end of the book there is a well selected general bibliography which should be useful to students because it is not indiscriminately and discouragingly lengthy. The work is marred unnecessarily by a few typographic errors, as in the spelling of Nicotiana tabacum on Plate 3 and in names of researchers in the bibliography, and a few errors of content, as in the statement that only far-red absorbing phytochrome causes floral induction. The inclusion of generic names would have been helpful in the index.

This book would serve as a good text for the topic in a general botany course or as a basic one augmented by more detailed and more modern material in a plant physiology course.

NOTES ON BRAZILIAN CYPERACEAE - I

Liene Teixeira Eiten
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1. Cyperus pelophilus Ridley

Among specimens of Cyperus sent to me for determination by the Instituto Agronômico do Norte, Recife, were encountered three examples of subgenus Pycreus from eastern Pernambuco. These were collected by Dr. Dárdano de A. Lima at the Usina Ôlho d'Água, about 20 km from the city of Aliança, where they were growing as weeds in a sugar cane field. Two of the collections were made on Sept. 13, 1958 and the third on Oct. 4, 1958. They are not provided with collection numbers. These three, plus another specimen from the Rio de Janeiro Botanical Garden (Loefgren 860, from Ceará), seemed to be all the same species. In Kükenthal's monograph (1936) the character "squamae sulcatae", used to separate sect. Sulcatae from the other sections in the subgenus, is neither clear nor exact. I therefore tried both leads in the key. Under sect. Sulcatae the material fell into C. rivularis Kunth, the only possibility in the section. This species is cited for America but not for Brazil. Loefgren 860 had been annotated as C. rivularis by M. Barros in 1955. However, the material did not fit the description of C. rivularis as a whole. The four collections differed in having more involucral bracts, the anthelas having more numerous and much longer rays with more spikelets per ray, more nerves on the keel, and a flexuous (zig-zag) rachilla instead of a straight one. The achenes in the material were always oboval-oblong, compressed with concave faces, i.e. sulcate, and with a truncate apex with a short mucro; the achene of C. rivularis is described as obovate, compressed-biconvex and shortly apiculate. (I had no material at hand of C. rivularis for examination.)

Trying the other sections, the four collections fell directly into sect. Polystachyi. Three species of this section, like the material at hand, are described as having sulcate achenes, C. atribulbus Kük., C. pelophilus Ridley and C. sulsimux C.B.Clarke. The first was known to Kükenthal only from two collections from southern Africa; it is described as perennial, the culms with bulbous bases. The material at hand is annual, the base of the culms is not bulbous, and, in general, the spikelets are much longer. From C. sulsimux the material differs in fundamental characters, but exactly fits C. pelophilus in these same characters, as shown in Table I.

Although the other species in the section did not fit the material, a special effort was made to see whether it was not a form of C. polystachyos Rottb., a very polymorphic species with non-sulcate achenes, occurring in both the Old and New World Tropics. Only the varieties polystachyos and texensis (Torr.) Fern. (var. leptostachyus Boeck.) were considered, since the other varieties recognized by Kükenthal seem to be merely variations of these two. Table II compares the material with

pelophilus and with the two varieties of polystachyos in those characters that most distinguish these taxa.

Table I

Character	C. sulsimux*	material	C. pelophilus
number of stamens	always 1	always 2	2
number of nerves on glume	3	5	5
anther shape	linear	short-oblong	short-oblong
number of involucral bracts	3-4	6, 6-7, 4-6, 5	5-6
achene shape	oblong or oblong-elliptic, apex acute, apiculate	obovate, apex truncate, apiculate	obovate, apex truncate, apiculate

* I was not able to see any material of this species; the information was taken from the text and illustrations in Mŭkenthal (1936) and Kern (1954).

Table II

Character	Material	pelophilus	polystachyos var. polystachyos	polystachyos var. texensis
underground organs	fibrous roots (annual)	fibrous roots (annual)	rhizomes (perennial)	(annual)
achene face	sulcate	sulcate	non-sulcate	non-sulcate
achene shape	obovate, apex truncate	obovate, apex truncate	oblong or subovate-oblong, apex subtrumcate	obovate, apex truncate or rounded-truncate
achene length mm	1.1 - 1.3	not given	0.75 - 1.0	(0.8) - 1.0
glume length mm	1.6-1.75 1.5-1.8 1.75 1.6-1.7 for the 4 collections 1.5-1.8	not given	1.5 - 2.0	1.5 - 2.3

The material differs from polystachyos particularly in characters of the achene, an organ of highest importance in the Cyperaceae. It is concluded that the material is C. pelophilus.

Since C. pelophilus is cited only for Africa and Madagascar, this represents, so far as I know, the first citation of this species for the New World. It is not possible to tell if the species is native or introduced into northeastern Brazil. The Pernambuco specimens are weeds, but no habitat is given for the Ceará specimen, which was collected more than 50 years ago.

2. Cyperus capillifolius A. Richard

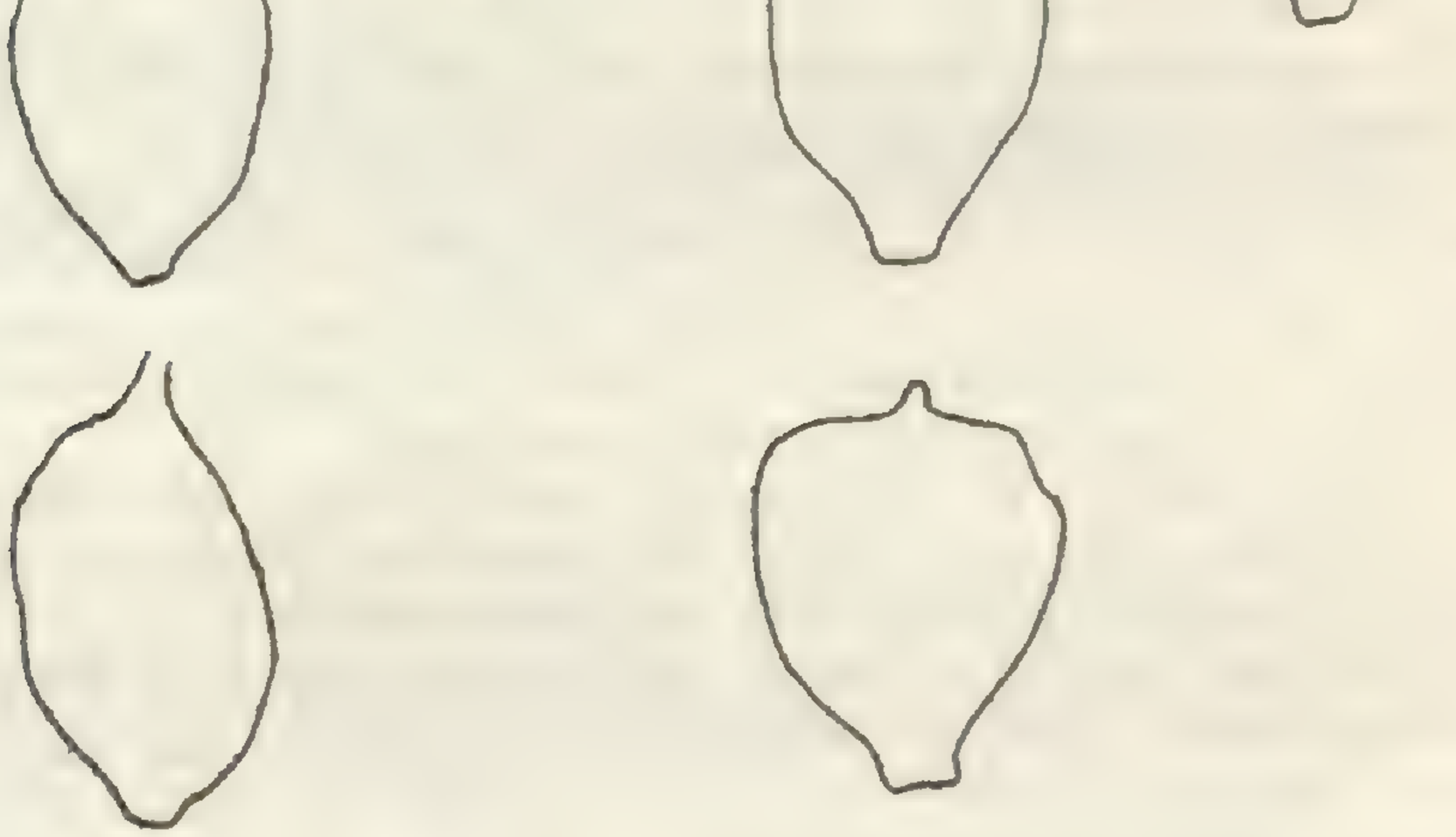
Examining three collections from the Rio de Janeiro Botanical Garden, G. Black 2162 B, L. Q. Williams & S. V. Assiz 6799, and Brade 17597, I concluded that they were C. capillifolius. The first two had been annotated as C. rivularis var. lagunetto by M. Barros in 1955.

These three collections are neither C. rivularis Kunth var. rivularis nor C. r. var. lagunetto (Steud.) Kük.; they differ in several important characters, especially in the bracts, glumes and achenes. Not having material at hand of C. rivularis or other well-identified material of C. capillifolius, the comparison was based on the descriptions and illustrations of these species as given by Kükenthal (1936), Fernald (1950), Mohlenbrock (1960), Gleason (1952) and Barros (1947). The following table shows the comparison.

Table III

Character	rivularis var. rivularis	rivularis var. lagunetto	material a = Brade 17597 b = Black 2162 B c = Williams & Assiz 6799	capillifolius
number of bracts	(2) 3–4	(1) 2–3	a– 2 b– 2 c– 2	2
glume length mm	2.0–2.5	2.1*	a– 1.25 b– 1.25 c– 1.25	1.25
achene length mm	1.0–1.5	1.0–1.1	a– 0.75 b– 0.70–0.90 c– 0.70	0.65**

Table III (continued)

Character	rivularis var. rivularis	rivularis var. lagunetto	material	capillifolius
achene shape***				

* Calculated from drawing in Barros (1947).
** Calculated from drawing and from glume length given in text in Kükenthal (1936). The scale given in Kükenthal's drawing does not correspond to the amplification actually used.
*** To compare the achene profiles more easily, all were drawn to the same size.

The material evidently conforms to capillifolius and not to rivularis. The two varieties of the latter species have achenes with rounded or with short-acuminate apices, while the achenes of capillifolius and of the three collections at hand have truncate apices. In all of the three collections at hand I noticed a small apical depression on the adaxial side of the achene, as shown in the table. The drawing of the achene of capillifolius, from an African specimen illustrated by Kükenthal, does not show this depression. If the depression really is lacking in all African material and occurs in all American

material, it could at most be a basis for separating subspecies, since in all other characteristics the material from both continents is essentially equal.

According to the literature, Cyperus rivularis var. rivularis is restricted to North America, while the subspecies lagunetto occurs there and also in Central America and the Andine region of South America.

Kükenthal cites many collections of C. capillifolius from Africa and Madegascar; where altitudes are given or may be inferred they are all high. He mentions only one collection of this species from the New World, Riedel 1405 from Serra da Lapa, Brazil. According to Riedel's itinerary given in the Flora Brasiliensis, this refers to the Serra da Lapa near Belo Horizonte, Minas Gerais, not the mountain range of the same name near Bom Jesus da Lapa in Bahia.

The three collections at hand also come from southern Minas and all grow at high altitudes:

George Black 2162 B, 26 Feb 1944, Catas Altas. The city of Catas Altas, 60 km ESE of Belo Horizonte, lies at an altitude of about 300 meters, but the mountainous country around it reaches 2000 meters.

Louis O. Williams & S. V. Assiz 6799, 5 May 1945, Serra de Monjolo, 18 km WNW of city of Serro, Municipio de Serro. The map gives an altitude of 1063 meters along a road near the mountain range of Serra de Monjolo, but the range itself reaches much greater heights.

Brade 17597 & A. Barbosa, 24 April 1945, São Sebastião do Paraíso, Morro do Baú. The mountain, Morro do Baú, varies in height between 1000 and 1200 meters.

The fact that the Riedel collection cited by Kükenthal and these three further collections all come from the same general region and have not come to light anywhere else in Brazil so far makes it probable that the species is native in this region. If it were an introduced weed, one would expect it rather scattered around larger areas of the country in semi-dry mountainous areas. Unfortunately, no data on habitat is given with the collections to show how disturbed the area was where they were collected, which might testify to its native or introduced status. As a native it would be a further example of the floristic relationship between Africa and Central Brazil.

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Fig. 1. Habit of Cyperus pelophilus Ridley (Loefgren 860, Ceará), X 1/2.

Fig. 2. Cyperus pelophilus Ridley (Loefgren 860).

A. Spikelet, X 10.

B. Rachilla of lower part of spikelet, X 25.

C. Flexuous, winged rachilla of upper part of spikelet, X 25.

D. Glume containing achene in natural position, X 25.

E. Upper part of a glume showing mucro, X 40.

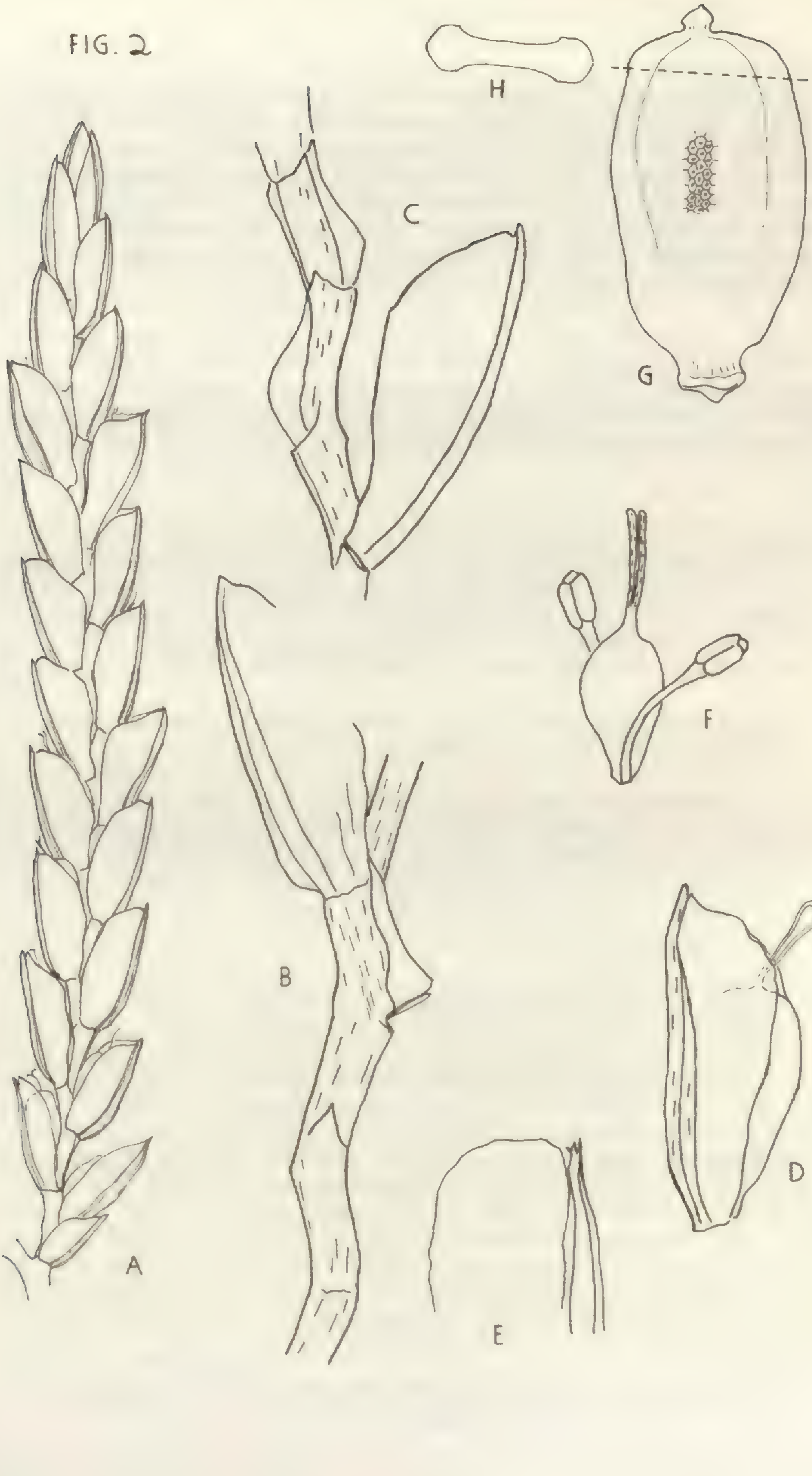
F. Flower, X 65.

G. Mature achene, X 40, showing one of the sulcate faces.

H. Transverse section of achene at the level indicated by the dashed line in G, showing the two sulcate faces. The depression is separated from the rest of the face by a sharp border.

FIG. 1

FIG. 2



DISTRIBUTION OF JUNCUS IN ILLINOIS

R. A. DeFilipps*

This article is intended for use as a supplement to A Taxonomic Study of Juncus in Illinois. Am. Midl. Nat. 71 (2): 296-319. 1964. I based that study (done in 1961-1962) on specimens from the herbaria of the following institutions: Chicago Museum of Natural History (F), Illinois State Museum, Springfield (ISM), Illinois Natural History Survey, Urbana (ILLS), University of Illinois, Urbana (ILL), University of Illinois, Chicago (CHI), Southern Illinois University, Carbondale (SIU).

In October-December 1965, the above herbaria were searched for additional material, and the collections of the Missouri Botanical Garden, St. Louis (MO) and Western Illinois University, Macomb (WIU) were examined. I wish to thank the curators of all the herbaria for the opportunity to see their collections.

During the course of these studies, specimens were encountered which sometimes alter the distribution of Juncus in Illinois as shown on the maps included by G.N.Jones & G.D.Fuller in Vascular Plants of Illinois 1955 and G.S.Winterringer & R.A.Evers in New Records for Illinois Vascular Plants 1960. The sequence of species below follows DeFilipps (1964).

1. Juncus secundus Beauv., in Poiret, Encycl. Method. Bot. Suppl. 3: 160. 1813. (Map 1)

Representative Specimens: GALLATIN CO.: SW. of Gibsonia, Evers 23509 (ILLS). HARDIN CO.: E. of Lamb, Evers 45053 (ILLS). JOHNSON CO.: Fern Clyffe, Bollwinkel & Windler FC37 (SIU). POPE CO.: 1 mi. SW. of Renshaw, Evers 45202 (ILLS). SALINE CO.: Old Indian Stonefort, Bailey & Swayne 1661 (SIU). UNION CO.: Panther's Den, MacMahon 323 (SIU).

2. Juncus dudleyi Wieg. in Bull. Torrey Club 27: 524. 1900. (Map 2)

Representative Specimens: ALEXANDER CO.: Cache, Cranwill s.n. (ILL). BOONE CO.: E. of Irene, Fell 54781 (ISM). CARROLL CO.: Mississippi Palisades, Wunderlin 2099(WIU). CASS CO.: Beardstown, McDonald s.n. (ILL). CHAMPAIGN CO.: Urbana, Jones 17902 (ILL). CLAY CO.: Larkingsburg Township, Evers 23815 (ILLS). COLES CO.: 3 mi. E. of Charleston, Evers 34502 (ILLS). COOK CO.: Morton Grove, Glassman 4439 (CHI). DE KALB CO.: W. of Sandwich, Evers 33652 (ILLS). DU PAGE CO.: W. of Wheaton, Moffatt 769 (ILL). EDGAR CO.: 3 mi. N. of Chrisman, Ozment & DeFilipps 2267 (SIU). FRANKLIN CO.: 3 mi. N. of Benton, Evers 23766 (ILLS). FULTON CO.: Canton, Wolf s.n. (F).

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GRUNDY CO.: S. of Morris, Evers 24631 (ILLS). HENDERSON CO.: Oquawka, Patterson s.n. (F). HENRY CO.: Geneseo, Dobbs s.n. (ILLS). JACKSON CO.: Fountain Bluff, S. of Gorham, Evers 26430 (ILLS). JASPER CO.: W. of Advance, Ozment & DeFilipps 1736A (SIU). JO DAVIESS CO.: 4 mi. N. of Galena, Evers 30027 (ILLS). KANE CO.: N. of Elgin, Steyermark 68356 (F). KANKAKEE CO.: SE. of St. Anne, Fuller 8934 (ISM). KNOX CO.: 1 mi. S. of Maquon, Evers 24214 (ILLS). LAKE CO.: Wauconda, Evers 4556 (ILLS). LIVINGSTON CO.: 3 mi. W. of Rowe, Fuller 8537 (ISM). LEE CO.: 2 mi. E. of Kingdom, Keithley 420 (ISM). LOGAN CO.: Near Lincoln, Fuller 8767 (ILLS). MC DONOUGH CO.: W. of Macomb, Myers 524 (ISM). MC HENRY CO.: Ringwood, Vasey s.n. (ILL). MACON CO.: S. of Boody, Evers 49649 (ILLS). MARION CO.: SW. of Kinmundy, Evers 23786 (ILLS). MENARD CO.: S. of Oakford, Rexroat 4839 (ISM). MERCER CO.: 9 mi. N. of New Boston, Evers 24311 (ILLS). MORGAN CO.: 8 mi. SW. of Arenzville, Rexroat 2737 (ISM). OGLE CO.: Kill-buck Creek, Fell 53694 (ISM). PIATT CO.: E. of Lodge, Evers 39366 (ILLS). SCOTT CO.: Near Oxville, Rexroat 3738 (ISM). ST. CLAIR CO.: Cahokia, collector unknown (MO). STARK CO.: Near Wady Petra, Chase 256 (ILL). TAZEWELL CO.: Spring Lake, Chase 13353 (ILL). VERMILION CO.: E. of Muncie, Evers 38610 (ILLS). WABASH CO.: Near Patton, Schneck s.n. (ILL). WILL CO.: Romeo, Steyermark 65846 (F). WILLIAMSON CO.: Devil's Kitchen Lake, Ellis & DeFilipps 3 (SIU). WINNEBAGO CO.: Rockford, Fuller & Haime 1912H (ISM). WOODFORD CO.: S. of Spring Bay, Chase 9692 (F).

3. Juncus interior Wieg. in Bull. Torrey Club 27: 516. 1900. (Map 3)

Representative Specimens: ADAMS CO.: S. of Lima, Evers 38377 (ILLS). BOND CO.: SW. of Mulberry Grove, Evers 23882 (ILLS). BROWN CO.: E. of Siloam Springs State Park, Evers 35216 (ILLS). CALHOUN CO.: Brussels, Muller s.n. (ILLS). CASS CO.: Rexroat 5602 (ISM). CHAMPAIGN CO.: 2 mi. E. of Fisher, Evers 39414 (ILLS). CHRISTIAN CO.: Pana, Thompson s.n. (ILLS). CLARK CO.: N. of Marshall, Evers 64673 (ILLS). CLAY CO.: Lar-kingsburg, Evers 37194 (ILLS). CLINTON CO.: N. of Carlyle, Evers 18017 (ILLS). COLES CO.: SW. of Mattoon, Evers 38166 (ILLS). COOK CO.: Skokie Marsh, Glencoe, Sherff s.n. (F). CRAWFORD CO.: Robinson, Tehon s.n. (ILLS). CUMBERLAND CO.: N. of Neoga, Evers 38216 (ILLS). DE WITT CO.: NE. of Kenney, Evers 60100 (ILLS). DOUGLAS CO.: N. of Galton, Evers 34409 (ILLS). DU PAGE CO.: W. of Wheaton, Moffatt 769 (ILL). FAY-ETTE CO.: N. of Farina, Evers 34120 (ILLS). FORD CO.: N. of Sibley, Evers 33432 (ILLS). FRANKLIN CO.: S. of Benton, Evers 65231 (ILLS). FULTON CO.: N. of Anderson Lake, Rexroat 4919 (ISM). GALLATIN CO.: Ridgway, Boewe s.n. (ILLS). GREENE CO.: 5 mi. N. of Eldred, Evers 33274 (ILLS). HAMILTON CO.: S. of Dahlgren, Evers 37359 (ILLS). HANCOCK CO.: E. of Warsaw, Evers 38264 (ILLS). HARDIN CO.: N. of Elizabethtown, Evers 30378 (ILLS). HENDERSON CO.: Oquawka, Patterson s.n. (F). HENRY CO.:

3-4 mi. N. of Annawan, Dobbs s.n. (F). IROQUOIS CO.: 2 mi. E. of Watseka, Evers 71127 (ILLS). JACKSON CO.: Finney, Mohlenbrock 5306 (SIU). JASPER CO.: Newton, Stout s.n. (F). JEFFERSON CO.: SE. of Opdyke, Evers 37326 (ILLS). JERSEY CO.: W. of Chautauqua, Evers 25044 (ILLS). JOHNSON CO.: Drappers Bluff, Bailey & Swayne 2466 (SIU). KANKAKEE CO.: Kankakee, Hill s.n. (F). KNOX CO.: Near Williamsfield, Chase 1859 (ILL). LA SALLE CO.: Starved Rock State Park, Ries & Werner s.n. (ILLS). LAWRENCE CO.: 2 mi. E. of Lawrenceville, Sivert s.n. (ILL). LEE CO.: Green River Area, Hawkins & Anderson s.n. (ILLS). LIVINGSTON CO.: Dwight, Evers 37935 (ILLS). LOGAN CO.: C. & D. Heitmann 874 (ISM). MC DONOUGH CO.: SE. of Fandon, Evers 43822 (ILLS). MC HENRY CO.: NE. of Harvard, Evers 61365 (ILLS). MACON CO.: Elm Ridge, Clokey 2431 (F). MACOUPIN CO.: E. of Carlinville, Evers 3839 (ILLS). MADISON CO.: Godfrey, Winterringer 17048 (ISM). MARION CO.: SW. of Kinmundy, Evers 37269 (ILLS). MASON CO.: W. of Saidora, Rexroat 4925 (ISM). MENARD CO.: Athens, Hall s.n. (F). MERCER CO.: N. of Keithsburg, Evers 24279 (ILLS). MONROE CO.: SE. of Waterloo, Evers 34002 (ILLS). MONTGOMERY CO.: NE. of Nokomis, Evers 65898 (ILLS). MOULTRIE CO.: NW. of Sullivan, Evers 12862 (ILLS). OGLE CO.: N. of Davis Junction, Fell 53495 (ISM). PEORIA CO.: Keller, Chase 13469 (SIU). PERRY CO.: Tamaroa, Stout s.n. (F). PIATT CO.: 2 mi. W. of Monticello, Evers 53908 (ILLS). PIKE CO.: Near Barry, Campbell & Alexopoulos s.n. (ILLS). PULASKI CO.: S. of Ullin, Evers 33152 (ILLS). PUTNAM CO.: NW. of Standard, Evers 30642 (ILLS). RANDOLPH CO.: N. of Evansville, Ahles 6134 (ILL). RICHLAND CO.: Decker Township, Ridgway 300 (F). ROCK ISLAND CO.: Near Silvis, Fell & Fell F48-154 (ILL). ST. CLAIR CO.: NW. of Marissa, Boewe s.n. (ILLS). SALINE CO.: Old Stone Face, Sands 552 (SIU). SANGAMON CO.: Salisbury, Fuller 7943 (ISM). SCHUYLER CO.: 4 mi. S. of Frederick, Evers 53696 (ILLS). SCOTT CO.: N. of Exeter, Rexroat 3807 (ISM). SHELBY CO.: Sigel, Evers 34066 (ILLS). STARK CO.: Near Wady Petra, Chase 91 (F). UNION CO.: SE. of Balcom, Evers 3125 (ILLS). VERMILION CO.: Kickapoo State Park, Bell & Bray 28 (ILL). WABASH CO.: Mt. Carmel, Schneck s.n. (ILL). WARREN CO.: W. of Swan Creek, Evers 11798 (ILLS). WASHINGTON CO.: E. of Venedy, Evers 17905 (ILLS). WAYNE CO.: S. of Wayne City, Evers 26190 (ILLS). WHITE CO.: N. of Brownsville, Ahles 4671 (ILL). WHITESIDE CO.: 2 mi. W. of Erie, Fell & Fell 47215 (ILL). WILLIAMSON CO.: S. of Cambria, Evers 37435 (ILLS). WINNEBAGO CO.: Near South Beloit, Fuller 13773 (F).

4. Juncus tenuis Willd. Sp. Pl. 2: 214. 1799. (Map 4)

Representative Specimens: ADAMS CO.: Quincy, Brinker 1201 (ISM). ALEXANDER CO.: Thebes, Cranwill s.n. (ILL). BOND CO.: N. of Tamalco, Evers 39301 (ILLS). BOONE CO.: NW. of Belvidere, Fell 54655 (ISM). BROWN CO.: 3 mi. W. of Ripley, Chase 12774 (ILL). BUREAU CO.: E. of Tiskilwa, Evers 39577 (ILLS). CALHOUN CO.: S. of Hamburg, Evers 49972 (ILLS). CARROLL CO.: Mississippi Palisades

State Park, Evers 29900 (ILLS). CASS CO.:N. of Virginia, Rexroat 3769 (ISM). CHAMPAIGN CO.: Near Urbana, Jones 13652 (ILL). CHRISTIAN CO.: Taylorville, Jones 22173 (ILL). CLARK CO.: Lincoln Trail State Park, Ozment & DeFilipps 1449 (SIU). CLAY CO.: N. of Louisville, Evers 41377 (ILLS). CLINTON CO.: N. of Carlyle, Evers 18020 (ILLS). COLES CO.: SW. of Mattoon, Evers 38186 (ILLS). COOK CO.: Thornton, Lansing 1373 (F). CRAWFORD CO.: S. of Heathsville, Evers 46799 (ILLS). CUMBERLAND CO.: Hazel Dell Area, Spooner s.n. (ILLS). DE KALB CO.: N. of Fairdale, Fell 53453 (ISM). DE WITT CO.: NW. of Kenney, Evers 46930 (ILLS). DOUGLAS CO.: SW. of Bourbon, Evers 38119 (ILLS). DU PAGE CO.: Wheaton, Fuller 1651 (ISM). EDGAR CO.: SE. of Kansas, Evers 34421 (ILLS). EDWARDS CO.: NE. of Grayville, Evers 44866 (ILLS). EFFINGHAM CO.: SW. of Mason, Evers 18565 (ILLS). FAYETTE CO.: N. of Laclede, Evers 43030 (ILLS). FRANKLIN CO.: N. of Zeigler, Evers 44756 (ILLS). FULTON CO.: NE. of Banner, Evers 17020 (ILLS). GALLATIN CO.: Pounds Hollow Lake, Evers 30315 (ILLS). GREENE CO.: W. of Barrow, Evers 11947 (ILLS). GRUNDY CO.: S. of Mazon, Evers 47365 (ILLS). HAMILTON CO.: S. of Dale, Winterringer 11123 (ISM). HANCOCK CO.: Carthage, Kirchherr 100 (ISM). HARDIN CO.: Elizabethtown, Evers 23538 (ILLS). HENDERSON CO.: Oquawka, Patterson s.n. (F). HENRY CO.: Geneseo, Dobbs s.n. (ILLS). IROQUOIS CO.: E. of Milford, Ahles 3239 (ILL). JACKSON CO.: Giant City, Mohlenbrock 977 (ISM). JASPER CO.: SE. of Newton, Evers 11102 (ILLS). JEFFERSON CO.: E. of Opdyke, Evers 34156 (ILLS). JERSEY CO.: Near Otterville, Winterringer 15292 (ISM). JO DAVIESS CO.: S. of Rice, Evers 25283 (ILLS). JOHNSON CO.: New Burnside, Boewe s.n. (ILLS). KANE CO.: SE. of Kaneville, Evers 47403 (ILLS). KANKAKEE CO.: E. of St. Anne, Graham 9335 (ISM). KENDALL CO.: SE. of Plattville, Evers 37902 (ILLS). KNOX CO.: E. of Dahinda, Evers 39864 (ILLS). LAKE CO.: Beach, Graham 9391 (ILL). LA SALLE CO.: Starved Rock State Park, Werner s.n. (ILLS). LAWRENCE CO.: Birds, Boewe s.n. (ILLS). LEE CO.: Amboy, Long 424 (ILL). LIVINGSTON CO.: 3 mi. W. of Rowe, Fuller 8537 (ISM). LOGAN CO.: SW. of Lake Fork, Evers 46933 (ILLS). MC DONOUGH CO.: Macomb, Myers 309 (ISM). MC HENRY CO.: Algonquin, Nason s.n. (ILL). MC LEAN CO.: S. of LeRoy, Evers 50879 (ILLS). MACON CO.: Elm Ridge, Clokey 2430 (ILL). MACOUPIN CO.: 2 mi. NE. of Shipman, Evers 38804 (ILLS). MADISON CO.: Godfrey, Winterringer 16639 (ISM). MARION CO.: Salem, Bebb s.n. (F). MARSHALL CO.: Henry City Park, Ozment & DeFilipps 1103A (SIU). MASON CO.: N. of Topeka, Ahles 4121 (ILL). MASSAC CO.: E. of Joppa, Evers 49768 (ILLS). MENARD CO.: Rexroat 3753 (ISM). MERCER CO.: W. of Eliza, Evers 39721 (ILLS). MONROE CO.: 1 mi. S. of Fults, Ozment s.n. (SIU). MONTGOMERY CO.: 2 mi. S. of Nokomis, Trojcak s.n. (ISM). MORGAN CO.: Near Alexander, Carter 15271 (ISM). MOULTRIE CO.: Wyman Park, Sullivan, Ozment & DeFilipps 2058 (SIU). OGLE CO.: E. of Oregon, Evers 37812 (ILLS). PEORIA CO.: NW. of Mossville, Chase 8949 (ISM). PERRY CO.: S. of Pyatts, Evers 18724 (ILLS). PIATT CO.: Near Monticello, Jones 17868 (ILL). PIKE CO.: Pittsfield, Boewe s.n. (ILLS). POPE CO.: N. of Herod, Ahles 2726 (ILL). PULASKI CO.: 1 mi. N. of America, Evers 11522 (ILLS).

PUTNAM CO.: 4 mi. E. of Henry, Ozment & DeFilipps 1181 (SIU). RANDOLPH CO.: Near Modoc, Trojcak 216R (ISM). RICHLAND CO.: Olney, Ridgway 120 (F). ROCK ISLAND CO.: Port Byron, Fuller 13788 (ISM). ST. CLAIR CO.: Dutch Hollow, Neill 858 (ISM). SALINE CO.: 1 mi. SW. of Carrier Mills, Evers 2769 (ILLS). SANGAMON CO.: Salisbury Township, Fuller 7943 (ILLS). SCHUYLER CO.: NE. of Littleton, Evers 18263 (ILLS). SCOTT CO.: 2 mi. N. of Manchester, Flynn 15159 (ISM). SHELBY CO.: Sigel, Evers 34069 (ILLS). STARK CO.: 1½ mi. NW. of Wady Petra, Chase 64 (F). TAZEWELL CO.: N. of East Peoria, Evers 39457 (ILLS). UNION CO.: E. of Larue, Evers 23935 (ILLS). VERMILION CO.: SE. of Oakwood, Evers 38646 (ILLS). WABASH CO.: Bellmont, Boewe s.n. (ILLS). WARREN CO.: N. of Monmouth, Ozment & DeFilipps 1060 (SIU). WASHINGTON CO.: Venedy, Evers 33949 (ILLS). WAYNE CO.: E. of Sims, Evers 44286 (ILLS). WHITE CO.: Dogtown Hills, S. of Maunie, Evers 44876 (ILLS). WHITESIDE CO.: E. of Fulton, Ozment & DeFilipps 547 (SIU). WILL CO.: Romeo, Umbach s.n. (F). WILLIAMSON CO.: S. of Carterville, Evers 18624 (ILLS). WINNEBAGO CO.: Rockford, Fell & Fell F48-360 (ILL). WOODFORD CO.: S. of Spring Bay, Chase 9686 (ILL).

5. Juncus vaseyi Engelm. in Trans. Acad. St. Louis 2: 448.1866. (Map 5)

Representative Specimens: COOK CO.: Cleaver's Woods, Bebb 942 (ILL). MC HENRY CO.: Near Ringwood, Vasey s.n. (MO). WINNEBAGO CO.: 2 mi. W. of South Beloit, Fell & Fell 47176 (ILL).

6. Juncus greenei Oakes & Tuckerm. in Tuckerm. in Am. Jour. Sci. 45: 37. 1843. (Map 6)

Representative Specimens: COOK CO.: Washington Heights, Bebb 947 (F). IROQUOIS CO.: ½ mi. N. of Pittwood, Evers 19032 (ILLS). KANKAKEE CO.: Kankakee, Hill 80 (ILL). LAKE CO.: Illinois Beach State Park, Brown 202 (ILL). LEE CO.: Green River Area, Bellrose s.n. (ILLS). WILL CO.: 2 mi. SE. of Custer Park, Steyermark 64854 (F). WINNEBAGO CO.: Near Shirland, Fell 53870 (ISM).

7. Juncus gerardi Loisel. in Jour. Bot. Desvaux 2: 284. 1809. (Map 7)

Representative Specimen: COOK CO.: Chicago, 92nd. & Stony Island, Glassman 3788 (CHI).

8. Juncus bufonius L. Sp. Pl. 328. 1753. var. bufonius (Map 8a)

Representative Specimens: CARROLL CO.: N. of Savanna, Ahles 4336 (ILL). CHAMPAIGN CO.: Urbana, Ahles 6326 (ILL). COOK CO.: Chicago, Vasey s.n. (F). DU PAGE CO.: W. of Wheaton, Moffatt 768 (ILL). HENDERSON CO.: Near Biggsville, Patterson s.n. (F). LAKE CO.: E. of Beach, Gates 2782 (F). MC HENRY CO.: Ringwood, Vasey s.n. (ILL). WABASH CO.: Shearer s.n. (ILL). WASHINGTON CO.: Irvington, French s.n. (SIU). WILL CO.: Drummond, Swink 46-A (SIU).

Juncus bufonius L. var. congestus Wahlb. Flora Gothoburgensis 38. 1820. (Map 8b)

Representative Specimen: COOK CO.: South Chicago, Hill 35. 1877 (ILL).

9. Juncus effusus L. Sp. Pl. 326. 1753 var. solutus Fern. & Wieg. in Rhodora 12: 90. 1910. (Map 9)

Representative Specimens: ALEXANDER CO.: SE. of Olive Branch, Evers 44486 (ILLS). CHRISTIAN CO.: Taylorville, Andrews s.n. (ILL). COOK CO.: Thornton, Fuller 1627 (ISM). EDWARDS CO.: Near Albion, Shearer s.n. (ILL). FRANKLIN CO.: Near Christopher, Jones 12165 (ILL). HAMILTON CO.: 2 mi. E. of Piopolis, Evers 5043 (ILLS). HENRY CO.: Near Ballon's Green River Bridge, Dobbs s.n. (ILLS). JACKSON CO.: Makanda, Seymour 29559 (ILL). JEFFERSON CO.: S. of Centralia, Campbell & Alexopoulos s.n. (ILLS). JOHNSON CO.: Near Vienna, Fuller 14696 (ISM). LA SALLE CO.: Starved Rock State Park, Lansing 3837 (F). LAWRENCE CO.: 1 mi. SE. of Lawrenceville, Sivert s.n. (ILL). LEE CO.: Amboy, Long 762 (ILL). MARION CO.: SW. of Alma, Ahles 5377 (ILL). MASSAC CO.: NW. of Boaz, Evers 30380 (ILLS). MONROE CO.: N. of Renault, Bailey & Swayne 2606 (SIU). PERRY CO.: NW. of Pinckneyville, Evers 17940 (ILLS). POPE CO.: Lake Glendale, Bailey & Swayne 1562 (SIU). PULASKI CO.: N. of Olmstead, Ahles 6200 (ILL). ROCK ISLAND CO.: Near Silvis, Chase 16999 (ILL). SALINE CO.: 1 mi. SW. of Carrier Mills, Evers 2808 (ILLS). UNION CO.: Pine Hills, Hardy 19 (SIU). WASHINGTON CO.: Irvington, French s.n. (SIU). WHITE CO.: E. of Norris City, Evers 23500 (ILLS). WILLIAMSON CO.: SW. of Carterville, Evers 30501 (ILLS). WINNEBAGO CO.: 2 mi. W. of South Beloit, Fell & Fell F47-160 (ISM).

10. Juncus balticus Willd. in Mag. Ges. Naturf. Freunde Berlin 3: 298. 1809. var. littoralis Engelm. in Trans. Acad. St. Louis 2: 442. 1866. (Map 10)

Representative Specimens: COOK CO.: Chicago, Vasey s.n. (ILL). JO DAVIESS CO.: E. of Woodbine, Ahles 4415 (ILLS). LAKE CO.: Waukegan, Fuller 7768 (ISM). MC HENRY CO.: Algonquin, Nason s.n. (ILL).

11. Juncus biflorus Ell. Bot. S. C. and Ga. 1:407. 1817.
f. biflorus (Map 11a)

Representative Specimens: BOND CO.: 1 mi. N. of Woburn, Evers 39318 (ILLS). CLAY CO.: Greendale, Evers 50750 (ILLS). CLINTON CO.: S. of Posey, Evers 31326 (ILLS). CRAWFORD CO.: W. of Oblong, Ahles 4845 (ILL). CUMBERLAND CO.: 1 mi. S. of Neoga, Winterringer 694 (ILL). EDWARDS CO.: 2 mi. W. of Samsville, Evers 70577 (ILLS). EFFINGHAM CO.: NE. of Mason, Evers 34082 (ILLS).

FAYETTE CO.: E. of Vandalia, O'Dell 543 (ILL). FRANKLIN CO.: S. of Benton, Evers 18615 (ILLS). GALLATIN CO.: Rt. 45 at Omaha Rd., Ozment & DeFilipps 1411 (SIU). HAMILTON CO.: S. of Dale, Winterringer 11122 (ISM). HARDIN CO.: Near Lamb, Buser 2856 (ILLS). JACKSON CO.: Makanda, Cranwill s.n. (ILL). JASPER CO.: Newton, Pepoon & Barrett s.n. (ILLS). JEFFERSON CO.: NW. of Belle Rive, Evers 18589 (ILLS). JOHNSON CO.: W. of Goreville, Evers 23735 (ILLS). KANKAKEE CO.: 3 mi. NW. of Bonfield, Jones 15881 (ILL). LAWRENCE CO.: 6 mi. S. of Sumner, Sivert s.n. (ILL). MARION CO.: Salem, Ahles 2885 (ILL). PERRY CO.: S. of Sunfield, Evers 30565 (ILLS). POPE CO.: Belle Smith Springs, Voigt 731 (SIU). PULASKI CO.: W. of Pulaski, Mohlenbrock & Voigt 5552 (SIU). RICHLAND CO.: 4 mi. SW. of Olney, Scherer & Shaw 396 (ISM). ST. CLAIR CO.: Brendel s.n. (ILL). SALINE CO.: W. of Harrisburg, Evers 17523 (ILLS). SHELBY CO.: Sigel, Evers 34074 (SIU). UNION CO.: French 2975 (SIU). WABASH CO.: S. of Keensburg, Ahles 4656 (ILL). WASHINGTON CO.: Irvington, French s.n. (SIU). WAYNE CO.: E. of Sims, Evers 65481 (ILLS). WHITE CO.: S. of Norris City, Evers 17785 (ILLS). WILLIAMSON CO.: Crab Orchard Lake, Sands & Garrison 338 (SIU).

Juncus biflorus Ell. f. *adimus* Fern. & Grisc. in Rhodora 37: 157. 1935. (Map 11b)

Representative Specimens: ALEXANDER CO.: McClure, Cranwill s.n. (ILL). CLARK CO.: 3 mi. N. of Marshall, Winterringer 11429 (ISM). WABASH CO.: About Mt. Carmel, Schneck s.n. (ILL).

12. *Juncus marginatus* Rostk. Monog. Junc. 38, pl. 2, f.3. 1801. (Map 12)

Representative Specimens: ADAMS CO.: Burton Cave, Evers, Jones, & Jones 1174 (ILL). CASS CO.: Beardstown, Benke 3919 (F). COOK CO.: Thornton, Fuller 1699 (ISM). FRANKLIN CO.: N. of Thompsonville, Evers 34193 (ILLS). GALLATIN CO.: S. of Kedron, Evers 26753 (ILLS). HANCOCK CO.: Augusta, Mead s.n. (F). IROQUOIS CO.: Near Beaverville, Jones 18817 (ILL). JOHNSON CO.: E. of Vienna, Winterringer 8998 (ISM). KANKAKEE CO.: Near St. Anne, Jones 16054 (ISM). LAWRENCE CO.: E. of Billett, Evers 29603 (ILLS). LEE CO.: Amboy, Long 598 (ILL). MASON CO.: W. of Manito, Chase 5260 (ILL). MENARD CO.: Athens, Hall s.n. (F). MORGAN CO.: N. of Jacksonville, Rexroat 4058 (ISM). RICHLAND CO.: 3½ mi. N. of Olney, Scherer 410 (ILL). SALINE CO.: SE. of Rudement, Evers 70271 (ILLS). SCHUYLER CO.: Rexroat 5216 (ISM). WAYNE CO.: Ellery, Boewe s.n. (ILLS). WHITE CO.: Norris City, Ahles 4676 (ILL). WILL CO.: 2 mi. SE. of Custer Park, Steyermark 64825 (F). WILLIAMSON CO.: Devil's Kitchen Lake, Stookey & Fore 517 (SIU). WINNEBAGO CO.: Campbell Bog, Fell 51695 (ISM).

13. *Juncus nodosus* L. Sp. Pl. ed. 2: 466. 1762. (Map 13)

Representative Specimens: COOK CO.: Chicago, Lansing 688 DU PAGE CO.: Bensenville, Bennett s.n. (ILLS). KANE CO.: N. of

Elgin, Steyermark 68353 (F). KANKAKEE CO.: Rock Creek, Hill 317.-1873 (ILL). LAKE CO.: E. of Zion, Brown 167 (ILL). LEE CO.: Amboy, Long 798 (ILL). MC HENRY CO.: Ringwood, Vasey s.n. (ILL). OGLE CO.: Byron, Blount 196 (ISM). PEORIA CO.: Peoria, Brendel s.n. (ILL). WASHINGTON CO.: Irvington, French s.n. (SIU). WILL CO.: Joliet, Skeels 420 (F). WINNEBAGO CO.: Rockford, Fuller & Haime 2131H (ISM). WOODFORD CO.: Adams Mill, McDonald s.n. (ILL).

14. Juncus torreyi Coville, in Bull. Torrey Club 22: 303. 1895. (Map 14).

Representative Specimens: ADAMS CO.: 1 mi. N. of Ursa, Brinker 3065 (ILL). ALEXANDER CO.: W. of Cairo, Winterringer 3122 (ISM). BOONE CO.: Near Caledonia, Fell 54863 (ISM). BROWN CO.:N. of locks, Rexroat 2951 (ISM). CARROLL CO.: Mississippi Palisades, Wunderlin 441 (WIU). CASS CO.: W. of Ashland, Chase 11292 (ILL). CHAMPAIGN CO.: Champaign, Seymour & Waite 29702 (ILL). CHRISTIAN CO.: Taylorville, Andrews s.n. (ILL). COLES CO.: Humboldt, Ammann s.n. (ILLS). COOK CO.: Morton Grove, Glassman 3735 (CHI). CRAWFORD CO.: 1 mi. S. of York, Ozment & DeFilipps 1250 (SIU). CUMBERLAND CO.: N. of Neoga, Winterringer 3425 (ISM). DE KALB CO.: Near Kirkland, Fell 53688 (ISM). DE WITT CO.: SW. of Kenney, Evers 34517 (ILLS). DOUGLAS CO.: Arcola, Mohr s.n. (ILLS). DU PAGE CO.: NE. of Wheaton, Moffatt 762 (ILL). EDGAR CO.: N. of Chrisman, Winterringer 14156 (ISM). EDWARDS CO.: 5 mi. S. of Browns, Evers 64869 (ILLS). EFFINGHAM CO.: N. of Effingham, Evers 20696 (ILLS). FAYETTE CO.: E. of Vandalia, O'Dell 571 (ILL). FORD CO.: Roberts, Ahles 3117 (ILL). FRANKLIN CO.: Benton Lake, Sands s.n. (SIU). FULTON CO.: 2 mi. S. of Vermont, Evers 30935 (ILLS). GALLATIN CO.: S. of Omaha, Evers 17769 (ILLS). GRUNDY CO.: SW. of Gardner, Evers 21683 (ILLS). HANCOCK CO.: E. of Niota, Evers 54921 (ILLS). HENDERSON CO.: Near Oquawka, Patterson s.n. (F). HENRY CO.: 1 mi. E. of Atkinson, Dobbs s.n. (ILLS). IROQUOIS CO.: Sand region, Tehon s.n. (ILL). JACKSON CO.: Boskydell, Cranwill s.n. (ILL). JEFFERSON CO.: E. of Opdyke, Evers 34157 (ILLS). JO DAVIESS CO.: 4 mi. S. of Galena, Ozment & DeFilipps 463 (SIU). KANE CO.: NW. of Elgin, Benke 3667 (F). KANKAKEE CO.: E. of St. Anne, Graham 9332 (ISM). KNOX CO.: Altona, Winterringer 18117 (ISM). LAKE CO.: Beach, Fuller 9390 (ILL). LA SALLE CO.: Starved Rock State Park, Werner s.n. (ILLS). LAWRENCE CO.: E. of Billett, Evers 34714 (ILLS). LEE CO.: Amboy, Long 201 (ILL). LIVINGSTON CO.: NW. of Strawn, Evers 13551 (ILLS). LOGAN CO.: Near Lincoln, Fuller 7182 (ILL). MC DONOUGH CO.: N. of Bushnell, Myers 1166 (ISM). MC HENRY CO.: Algonquin, Nason s.n. (ILL). MC LEAN CO.: Fuller 180 (ISM). MACON CO.: NW. of Decatur, Evers 38699 (ILLS). MACOUPIN CO.: Carlinville, Robertson s.n. (ILLS). MARION CO.: NE. of Alma, Evers 70451 (ILLS). MARSHALL CO.: W. of Varna, Evers 7097 (ILLS). MASON CO.: E. of Mason City, Evers 5881 (ILLS). MENARD CO.: S. of Oakford, Rexroat 5164 (ISM). MONTGOMERY CO.: Litchfield, Jones 2206 (ILL). MORGAN CO.: N. of Jacksonville, Rexroat 4067 (ISM). PEORIA CO.: Peoria, Brendel s.n. (ILL). PERRY CO.: S. of Sunfield, Evers 30560 (ILLS). PIATT CO.: NW. of Lodge, Evers 46885 (ILLS).

PUTNAM CO.: S. of Swan Lake, Ozment & DeFilipps 145 (SIU). RANDOLPH CO.: 5 mi. S. of Sparta, Winterringer 6665 (ISM). RICHLAND CO.: 4 mi. N. of Olney, Scherer & Shaw 692 (ISM). ROCK ISLAND CO.: Near Port Byron, Fuller 13787 (ILL). ST. CLAIR CO.: Cahokia, Eggert 13926 (F). SALINE CO.: 3 mi. SW. of Eldorado, Evers 51586 (ILLS). SANGAMON CO.: E. of Buffalo Hart, Evers 12037 (ILLS). SCHUYLER CO.: S. of Frederick, Evers 5910 (ILLS). SCOTT CO.: Merritt, Rexroat 3797 (ISM). SHELBY CO.: 2 mi. E. of Tower Hill, Boewe s.n. (ILLS). STARK CO.: SE. of Wyoming, Evers 18111 (ISM). TAZEWELL CO.: E. of Mackinaw, Evers 18218 (ILLS). VERMILION CO.: Muncie, Bell 231 (ILL). WABASH CO.: Mt. Carmel, Shearer s.n. (ILL). WILL CO.: 1 mi. E. of Braidwood, Yokoyama s.n. (CHI). WINNEBAGO CO.: Kent Creek, Fell 51250 (ISM). WOODFORD: S. of Minonk, Evers 54610 (ILLS).

15. Juncus brachycarpus Engelm. in Trans. Acad. St. Louis 2: 467. 1868. (Map 15)

Representative Specimens: ALEXANDER CO.: Near Diswood, Winterringer 10333 (ISM). BOND CO.: E. of Greenville, Winterringer 15950 (ISM). CHRISTIAN CO.: Taylorville, Andrews s.n. (ILL). CLAY CO.: S. of Flora, Winterringer 8206 (ISM). CLINTON CO.: S. of Posey, Evers 31328 (ILLS). COOK CO.: Thornton, Fuller 2295 (ISM). CRAWFORD CO.: Between Oblong and Stoy, Ahles 4904 (ILL). CUMBERLAND CO.: S. of Greenup, Winterringer 11290 (ISM). EDWARDS CO.: 2 mi. W. of Samsville, Evers 70576 (ILLS). EFFINGHAM CO.: NE. of Mason, Evers 34096 (ILLS). FAYETTE CO.: N. of Laclede, Evers 43037 (ILLS). FRANKLIN CO.: N. of Thompsonville, Evers 34191 (ILLS). HAMILTON CO.: S. of Dale, Winterringer 11126 (ISM). HARDIN CO.: Near Rosiclare, Winterringer 2425 (ISM). JACKSON CO.: Giant City, Mohlenbrock 763 (SIU). JASPER CO.: SE. of Newton, Evers 11115 (ILLS). JEFFERSON CO.: SE. of Opdyke, Evers 37307 (ILLS). KANKAKEE CO.: SE. of St. Anne, Fuller 8937 (ISM). LAWRENCE CO.: E. of Billett, Evers 29612 (ILLS). MACON CO.: 1 mi. N. of Decatur, Shouse s.n. (ILL). MACOUPIN CO.: Carlinville, Robertson s.n. (ILLS). MADISON CO.: Near Canteen Lake, Eggert s.n. (MO). MARION CO.: Salem, Ahles 2886 (ILL). MC HENRY CO.: Ringwood, Vasey s.n. (ILL). MENARD CO.: Near Athens, Hall s.n. (F). MONROE CO.: 10 mi. SE. of Waterloo, Winterringer 6666 (ISM). MONTGOMERY CO.: S. of Litchfield, Winterringer 3897 (ISM). PEORIA CO.: Peoria, Brendel s.n. (ILL). PERRY CO.: 3 mi. N. of Tamaroa, Chase 6601 (ILL). PIATT CO.: 2 mi. W. of Monticello, Evers 53910(ILLS). POPE CO.: Herod, Schopf s.n. (ILLS). PULASKI CO.: 4 mi. S. of Ullin, Winterringer 11128 (ISM). RANDOLPH CO.: Red Bud, Pammel s.n. (MO). RICHMOND CO.: 3 mi. N. of Olney, Scherer 483 (ILL). ST. CLAIR CO.: Brendel s.n. (ILL). SALINE CO.: Near Texas City, Buser 6251 (ILLS). SANGAMON CO.: Between Riverton & Illiopolis, Winterringer 17220 (ISM). UNION CO.: Panther's Den, MacMahon 468 (SIU). WABASH CO.: Near Mt. Carmel, Schneck s.n. (ILL). WASHINGTON CO.: Irvington, French s.n. (SIU). WHITE CO.: E. of Norris City, Evers 23502 (ILLS). WILL CO.: 1 mi. SW. of Braidwood, Evers 10486 (ILLS). WILLIAMSON CO.: S. of Cambria, Evers 37439 (ILLS).

16. Juncus scirpoides Lam. Encycl. Meth. Bot. 3: 267. 1789. var. scirpoides (Map 16)

Representative Specimens: CASS CO.: Beardstown, Benke 3920 (F). LAWRENCE CO.: E. of Billett, Evers 34707 (ILLS). MENARD CO.: S. of Oakford, Rexroat 5515 (ISM).

17. Juncus diffusissimus Buckl. in Proc. Acad. Phila. 14: 9. 1862. (Map 17)

Representative Specimens: JACKSON CO.: Giant City, Mohlenbrock 253 (SIU). JEFFERSON CO.: Mt. Vernon City Reservoir, Fore & Stookey 745 (SIU). LAWRENCE CO.: 1 mi. NE. of Sumner, Sivert s.n. (ILL). MASSAC CO.: W. of Midway, Evers 67062 (ILLS).

18. Juncus nodatus Cov. in Britt. & Brown, Illustr. Fl. N. Un. St., ed.2, 1: 482. 1913. (Map 18)

Representative Specimens: BOND CO.: Near Greenville, Pepoon & Barrett 5167 (ILLS). CHRISTIAN CO.: Lake Pana, Trojcak s.n. (ISM). CLAY CO.: S. of Flora, Ahles 2672 (ILL). CUMBERLAND CO.: S. of Neoga, Evers 30850 (ILLS). FAYETTE CO.: Ramsey, Marty 17073 (ISM). FRANKLIN CO.: Benton Lake, Fore & Stookey 658 (SIU). HANCOCK CO.: Augusta, Mead s.n. (MO). JACKSON CO.: Crab Orchard Lake, Abney & Dillard 113 (SIU). JEFFERSON CO.: N. of Mt. Vernon, Fore & Stookey 744 (SIU). LAWRENCE CO.: E. of Sumner, Sivert s.n. (ILL). MACOUPIN CO.: Carlinville, Robertson s.n. (ILLS). MARION CO.: Salem, Ahles 2887 (ILLS). MONTGOMERY CO.: SW. of Litchfield, Evers 12078 (ILLS). POPE CO.: Near Bell Smith Springs, Bailey & Swayne 3028 (SIU). ST. CLAIR CO.: Brendel s.n. (ILL). WASHINGTON CO.: Irvington, French s.n. (SIU). WAYNE CO.: Fairfield Reservoir, Fore & Stookey 727 (SIU). WHITE CO.: Norris City, Buser 2589 (ILLS). WILLIAMSON CO.: Cambria, Bell s.n. (SIU).

19. Juncus acuminatus Michx. Fl. Bor. Am. 1: 192. 1803. (Map 19)

Representative Specimens: ALEXANDER CO.: Cache, Cranwill s.n. (ILL). BOND CO.: E. of Smithsboro, Evers 18053 (ILLS). CASS CO.: Bluff Springs, Rexroat 3785 (ISM). CHRISTIAN CO.: Taylorville, Andrews s.n. (ILL). COOK CO.: Berwyn, Hill 36.1908 (ILL). CRAWFORD CO.: 2 mi. S. of Heathsville, Evers 4089 (ILLS). CUMBERLAND CO.: N. of Neoga, Evers 38221 (ILLS). EDWARDS CO.: 3 mi. N. of Albion, Fore & Stookey 716 (SIU). EFFINGHAM CO.: S. of Montrose, Evers 16448 (ILLS). FAYETTE CO.: 2 mi. N. of Hagerstown, Evers 23866 (ILLS). FRANKLIN CO.: Benton Lake, Sands s.n. (SIU). FULTON CO.: Wolf s.n. (F). HAMILTON CO.: S. of Dale, Evers 65461 (ILLS). HANCOCK CO.: Augusta, Mead s.n. (MO). HARDIN CO.: NE. of Eichorn, Evers 34346 (ILLS). HENDERSON CO.: Oquawka, Patterson 12 (F). HENRY CO.: 3-4 mi. N. of Annawan, Dobbs s.n. (ILLS). IROQUOIS CO.: Sand region, Tehon s.n. (ILLS). JACKSON CO.: Giant City, Voigt 1457 (SIU). JEFFERSON CO.: NE. of Mt. Vernon, Boewe s.n. (ILLS). JOHNSON CO.: Busby Hollow, Voigt s.n. (SIU). KANKAKEE CO.: Kankakee, Hill 51.1871 (ILL). LAWRENCE CO.: E. of

Billett, Evers 29611 (ILLS). LEE CO.: Amboy, Long 203 (ILL). MC-HENRY CO.: Ringwood, Vasey s.n. (F). MACOUPIN CO.: Carlinville, Andrews s.n. (ILL). MADISON CO.: H. Eggert s.n. (MO). MARION CO.: Bebb s.n. (F). MASON CO.: W. of Saidora, Rexroat 5492 (ILLS). MASSAC CO.: NE. of Metropolis, Winterringer 11919 (ISM). MENARD CO.: Athens, Hall 15 (F). MONROE CO.: S. of Burksville, Bollwinkel 253 (SIU). PEORIA CO.: Stewart s.n. (F). PERRY CO.: S. of Pyatts, Evers 18722 (ILLS). PIATT CO.: N. of Monticello, Ahles 6575 (ILL). PIKE CO.: NE. of Chambersburg, Evers 60233 (ILLS). POPE CO.: E. of Dixon Springs, Evers 23552 (ILLS). PULASKI CO.: N. of Pulaski, Evers 46486 (ILLS). RANDOLPH CO.: Coulterville Reservoir, Fore & Stockey 645 (SIU). RICHLAND CO.: Decker Township, Ridgway 241 (F). ROCK ISLAND CO.: Port Byron, Fuller 13789 (ISM). ST. CLAIR CO.: W. of Edgemont, Neill 845 (ISM). SALINE CO.: Near Eldorado, Buser 6716 (ILLS). STARK CO.: Near Wady Petra, Chase 1878 (ILL). TAZEWELL CO.: Pekin, Chase 10848 (ILL). UNION CO.: E. of Dongola, Pepoon & Mohr 307 (ILLS). WABASH CO.: Shearer farm, Shearer s.n. (ILL). WASHINGTON CO.: Venedy Station, Evers 33940 (ILLS). WHITE CO.: S. of Norris City, Evers 17782 (ILLS). WHITESIDE CO.: 1 mi. W. of Erie, Fuller 13681 (ISM). WILL CO.: 2 mi. SE. of Custer Park, Steyermark 64840 (ILL). WILLIAMSON CO.: Carterville, Bell s.n. (SIU). WINNEBAGO CO.: ½ mi. W. of Shirland, Fell & Fell F46401 (ISM).

20. Juncus canadensis J. Gay ex Laharpe, in Mem. Soc. Hist. Nat. Paris 4: 134. 1825. (Map 20)

Representative Specimens: CASS CO.: W. of Virginia, Rexroat 7362 (ISM). COOK CO.: Thornton, Fuller 1971 (F). HANCOCK CO.: Augusta, Mead s.n. (MO). HENRY CO.: ¼ mi. S. of Snedaker's, Dobbs s.n. (ILLS). IROQUOIS CO.: NE. of Beaverville, Evers 35710 (ILLS). KANKAKEE CO.: Kankakee, Hill 91.1973 (ILL). LAKE CO.: Zion, Evers 40109 (ILLS). LEE CO.: Amboy, Long 631 (ILL). MC HENRY CO.: Ringwood, Vasey s.n. (F). MENARD CO.: Athens, Hall s.n. (F). OGLE CO.: Pine Rock Bog, Spongberg 63/158 (ISM). WABASH CO.: About Mt. Carmel, Schneck s.n. (ILL). WILL CO.: SW. of Wilmington, Pepoon & Barrett 5384 (ILLS). WINNEBAGO CO.: NW. of Rockton, Evers 40226 (ILLS).

21. Juncus brachycephalus (Engelm.) Buch. in Bot. Jahrb. 12: 268. 1890. (Map 21)

Representative Specimens: COOK CO.: Englewood, Hill 114 (ILL). KANE CO.: Elgin, Benke 3668 (F). KANKAKEE CO.: Kankakee, Hill 107 (ILL). LAKE CO.: Waukegan, Benke 2933 (F). MC HENRY CO.: N. of Hebron, Evers 40165 (ILLS). PEORIA CO.: Peoria, Brendel s.n. (ILL). TAZEWELL CO.: 3 mi. N. of East Peoria, Evers 21739 (ILLS). WOODFORD CO.: Adams Mills, McDonald s.n. (F).

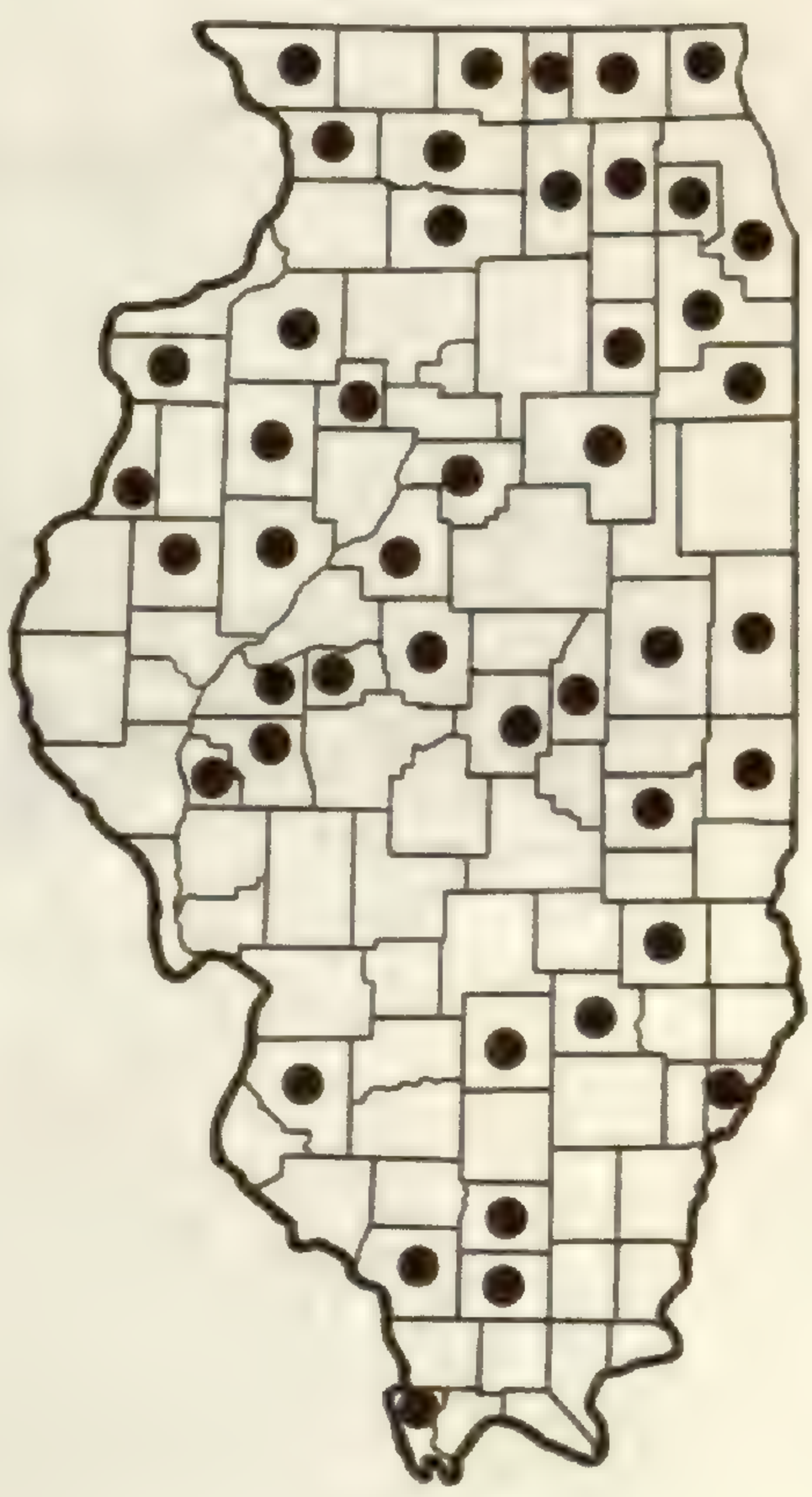
22. Juncus alpinus Vill. Histoire des Plantes de Dauphine 2: 233. 1787. var. rariflorus Hartm., Skand. Fl., ed. 7, 240. 1858. (Map 22a)

Representative Specimens: COOK CO.: South Chicago, Hill 35.1875 (ILL). KANE CO.: Elgin, Vasey s.n. (F). LAKE CO.: Waukegan, Gates 2923 (ILL). MC HENRY CO.: Ringwood, Vasey s.n. (F 467500).

Juncus alpinus Vill. var. fuscescens Fern. in Rhodora 10: 48. 1908. (Map 22b)

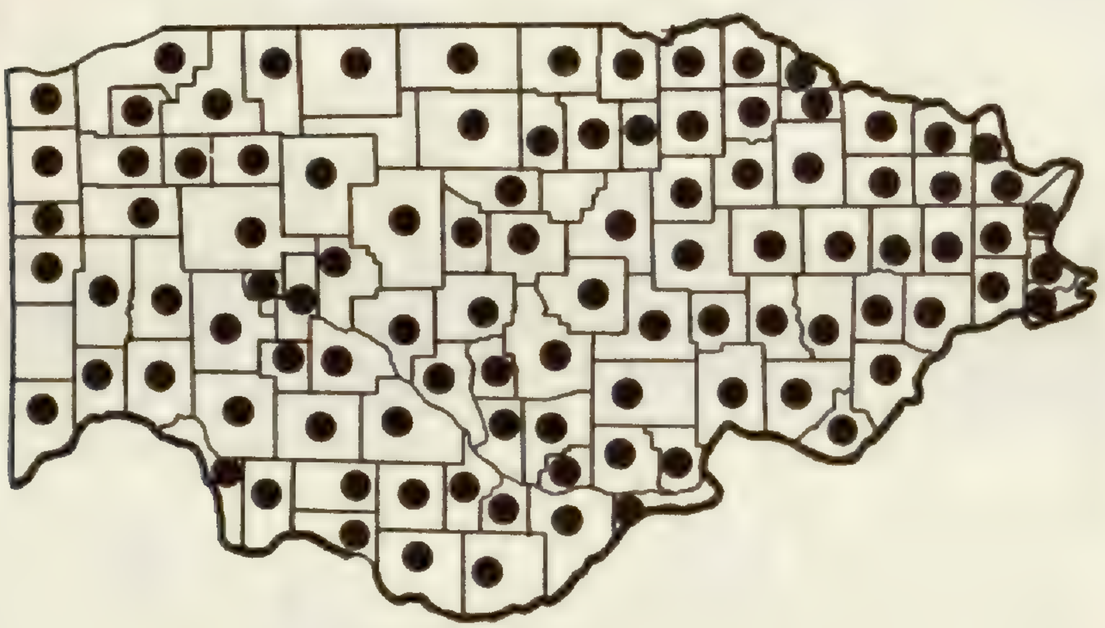
Representative Specimens: COOK CO.: Chicago, Lansing 257 (F). LAKE CO.: Waukegan, Gates 2859 (F).

Map 1
Juncus secundus Beauv.

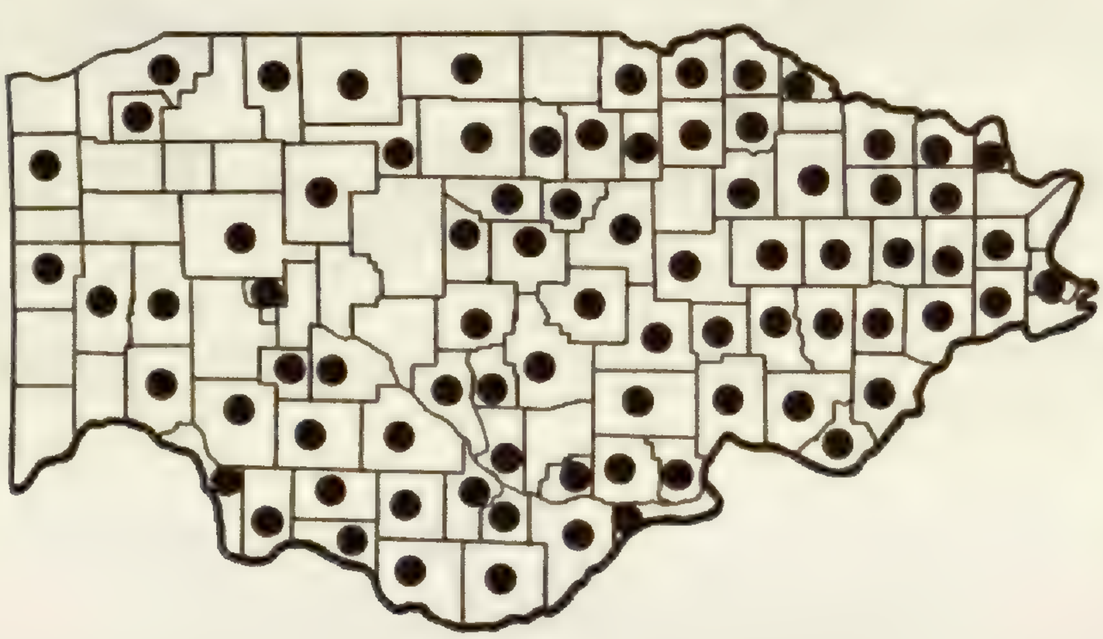


Map 2
Juncus dudleyi Wieg.

Map 5
Juncus vaseyi Engelm.



Map 4
Juncus temuis Willd.



Map 3
Juncus interior Wieg.

Map 6
Juncus greenei Oakes & Tuckerm.

Map 7
Juncus gerardi Loisel.

Map 8a
Juncus bufonius L. var. bufonius

Map 8b
Juncus bufonius L.
var. congestus Wahlb.

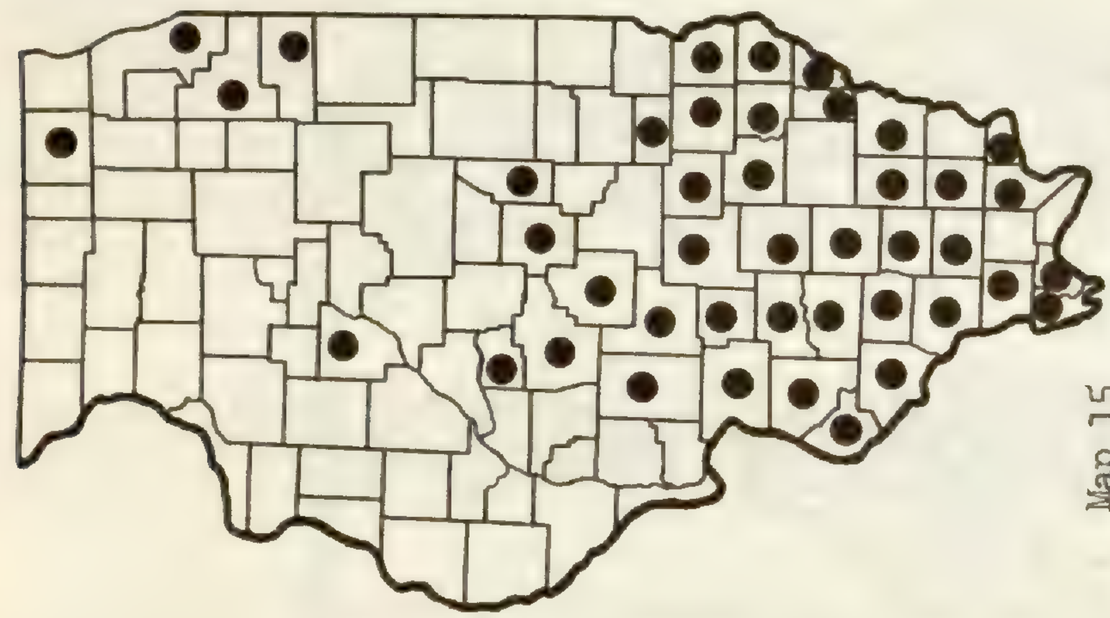
Map 9
Juncus effusus L. var.
solutus Fern. & Wieg.

Map 10
Juncus balticus Willd.
var. littoralis Engelm.

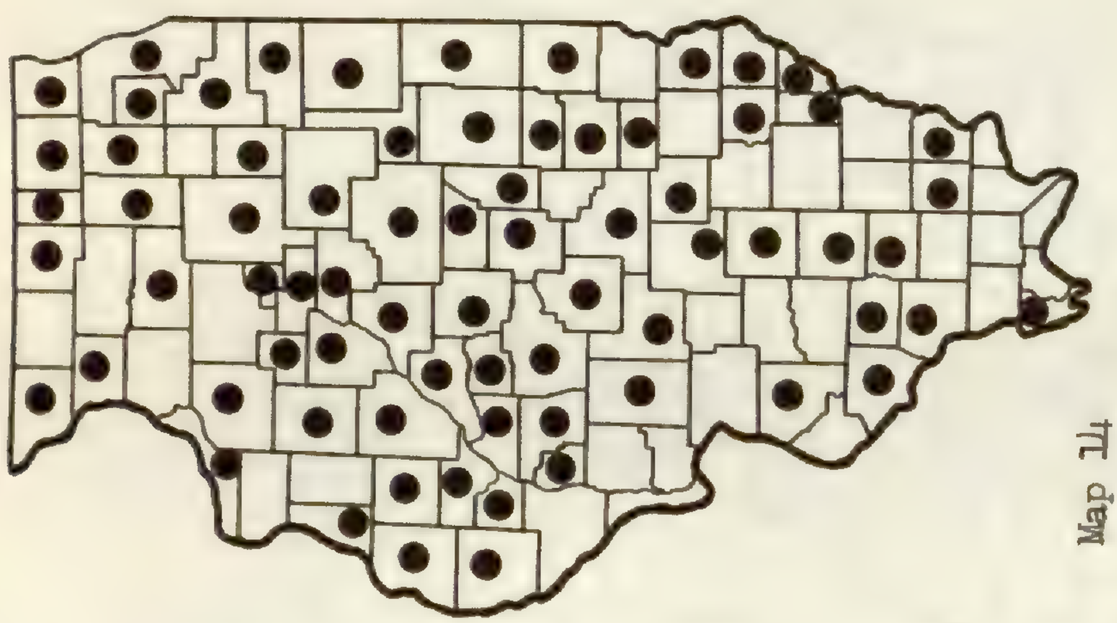
Map 11a
Juncus biflorus Ell.
f. biflorus

Map 11b
Juncus biflorus Ell.
f. adinus Fern. & Grisc.

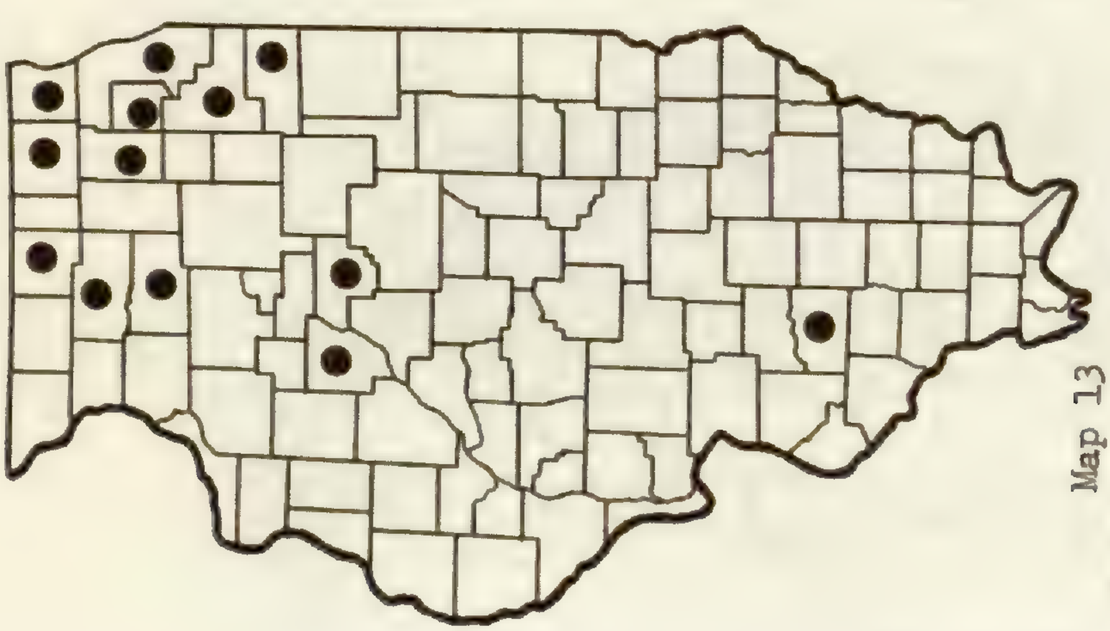
Map 12
Juncus marginatus Rostk.



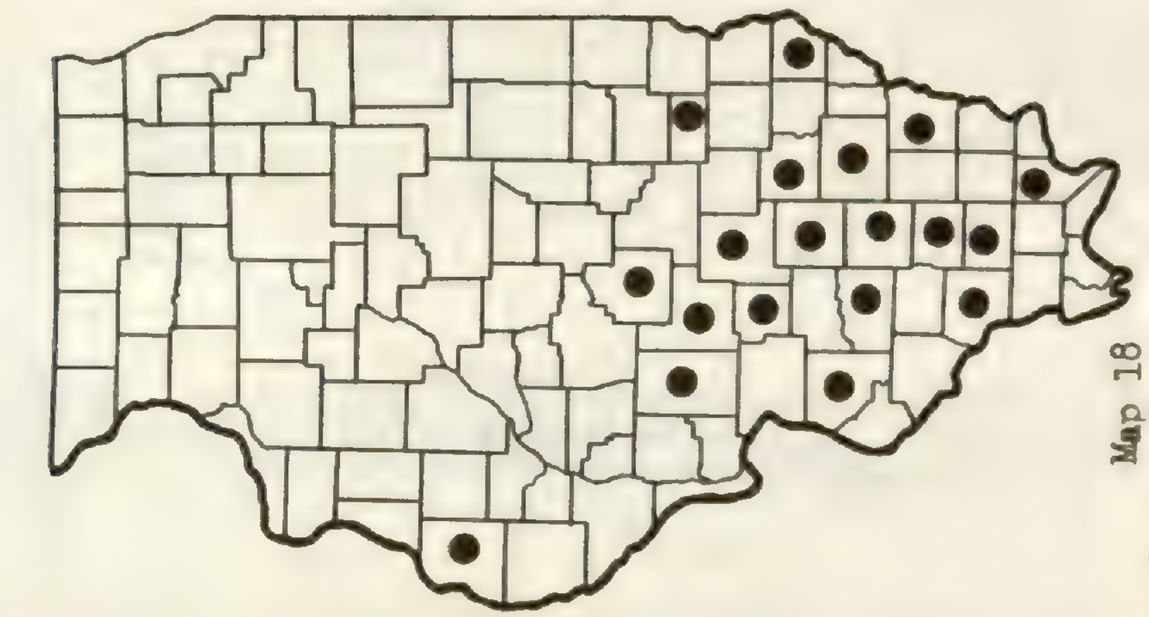
Map 15
Juncus brachycarpus Engelm.



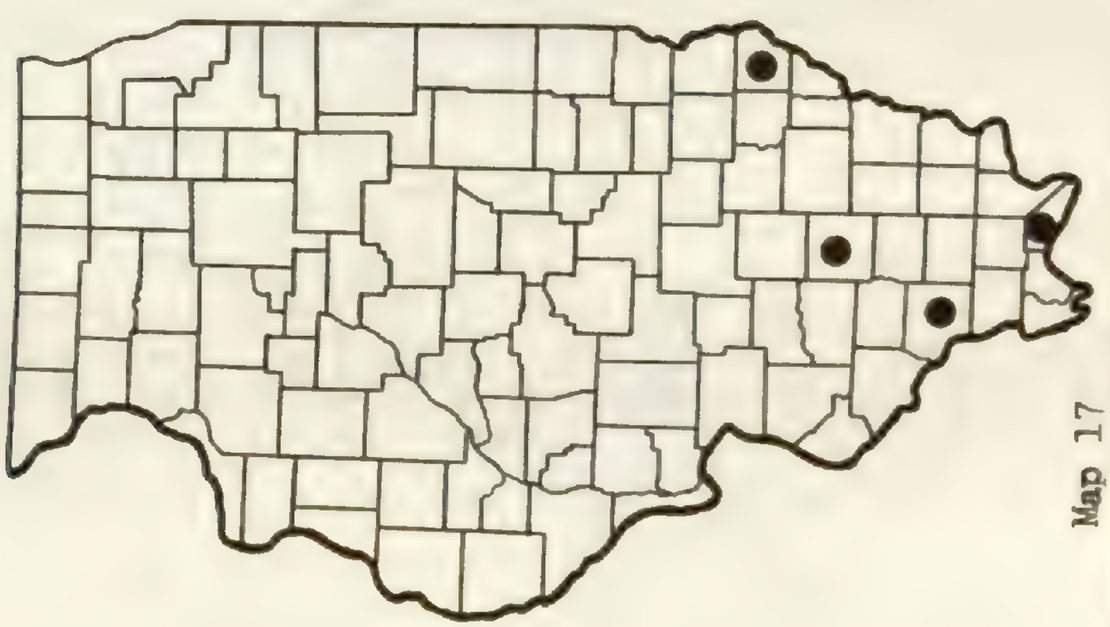
Map 14
Juncus torreyi Coville



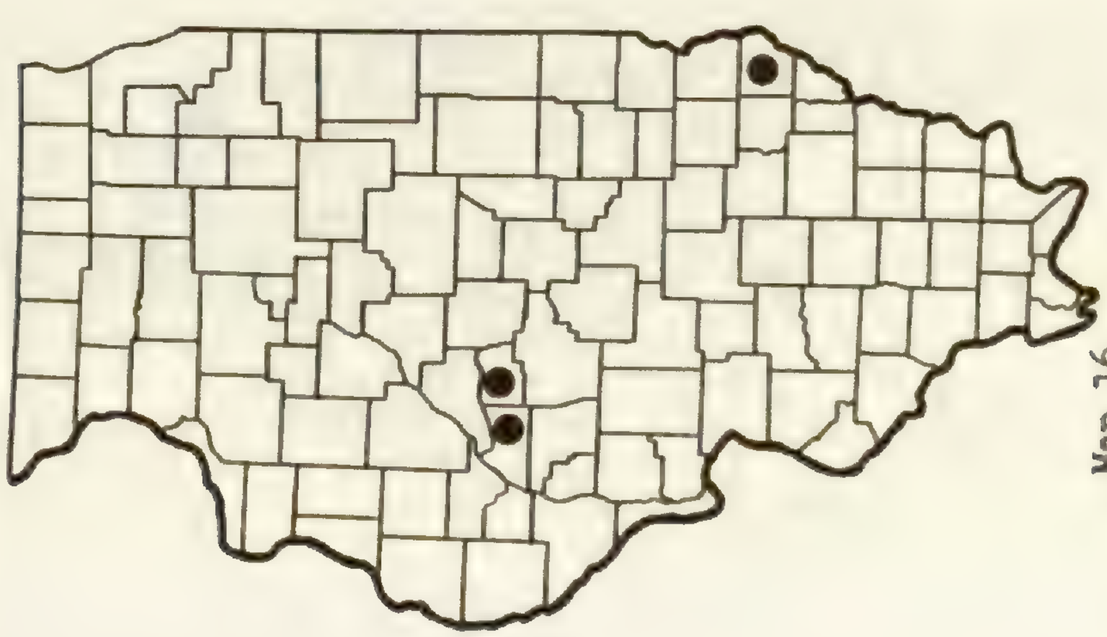
Map 13
Juncus nodosus L.



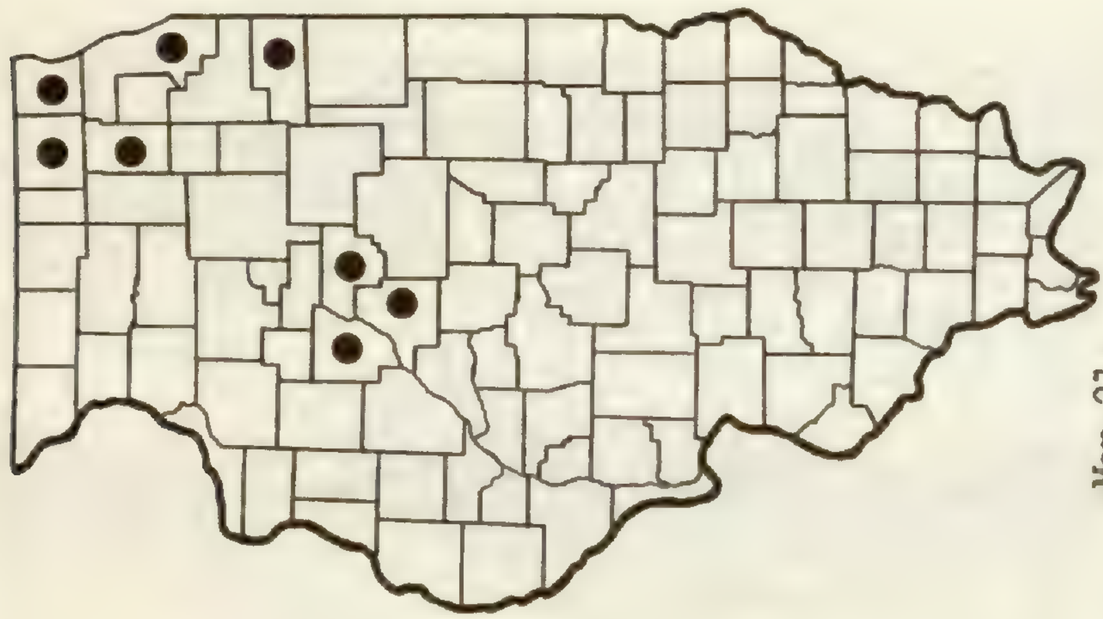
Map 18
Juncus nodatus Cov.



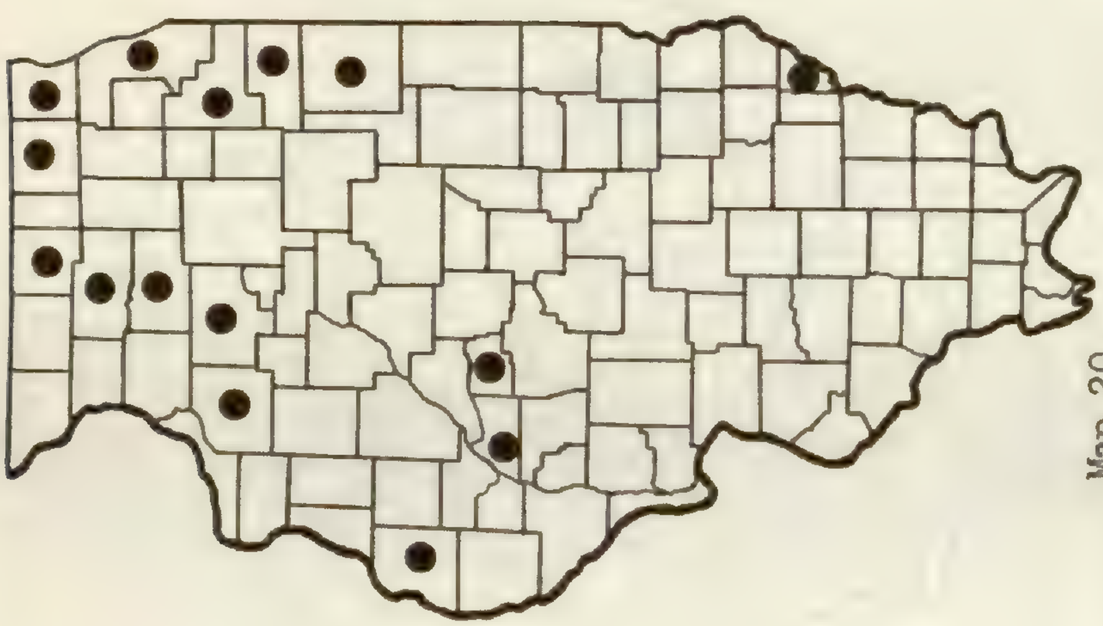
Map 17
Juncus diffusissimus Buckl.



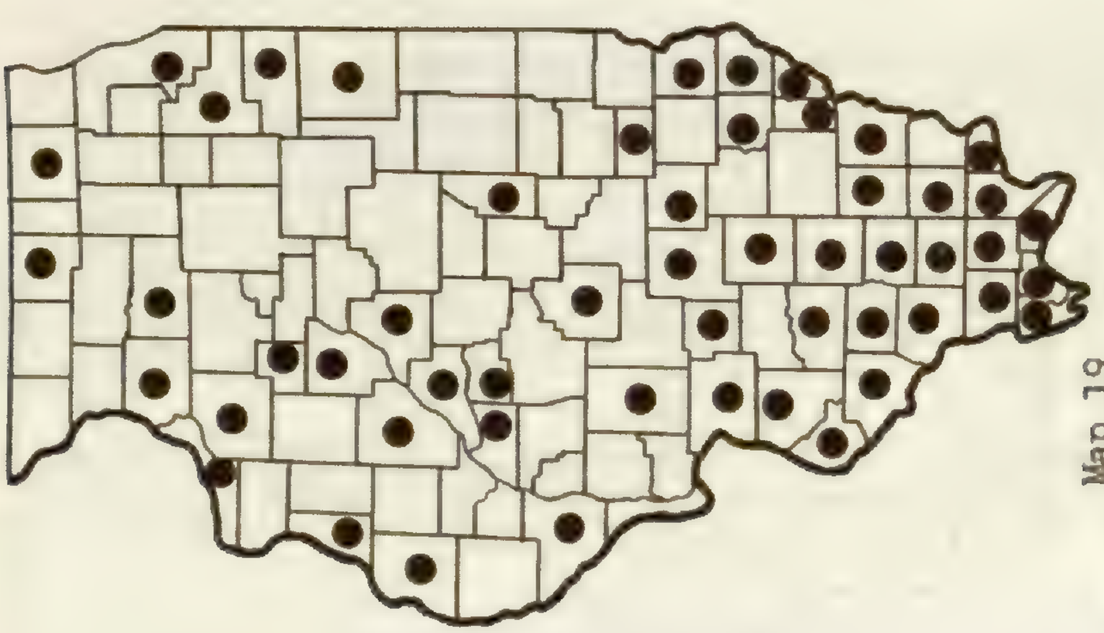
Map 16
Juncus scirpoides Lam.



Map 21
Juncus brachycephalus (Engelm.) Buch.



Map 20
Juncus canadensis J.Gay



Map 19
Juncus acuminatus Michx.

Map 22a
Juncus alpinus Vill.
var. rariflorus Hartm.

Map 22b
Juncus alpinus Vill.
var. fuscescens Fern.

JO DAVIESS
STEPHENSON
WINNEBAGO
BOONE
McHENRY
LAKE
CARROLL
OGLE
DeKALB
KANE
COOK
DuPAGE
WHITESIDE
LEE
KENDALL
WILL
LaSALLE
BUREAU
HENRY
ROCK ISLAND
GRUNDY
MERCER
KANKAKEE
STARK
PUTNAM
KNOX
WARREN
HENDERSON
MARSHALL
LIVINGSTON
PEORIA
IROQUOIS
WOODFORD
HANCOCK
McDONOUGH
FULTON
McLEAN
TAZEWELL
FORD
MASON
VERMILION
SCHUYLER
LOGAN
CHAMPAIGN
ADAMS
DeWITT
PIATT
BROWN
CASS
MENARD
MACON
MORGAN
SANGAMON
PIKE
DOUGLAS
EDGAR
SCOTT
MOULTRIE
CHRISTIAN
COLES
GREENE
MACOUPIN
SHELBY
CALHOUN
CLARK
MONTGOMERY
CUMBERLAND
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FAYETTE
EFFINGHAM
JASPER
CRAWFORD
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CLAY
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CLINTON
SAINT CLAIR
WAYNE
EDWARDS
WABASH
WASHINGTON
JEFFERSON
MONROE
RANDOLPH
PERRY
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CERTAMEN MELASTOMATACEIS X. 25508

John J. Wurdack
Dept. of Botany, U. S. National Museum

To a botanist whose ultimate aim is taxonomic orderliness, the Andean flora is a never-ending challenge. In particular, the classification of cordilleran melastomes seems like an Augean stable, with unending adjustments being needed and new character combinations constantly appearing in the herbarium. The current continuation of my velitation accounts for the non-Ecuadorian novelties collected by the Maguires during their 1959 Andean trip, miscellany discovered during a study of W. H. Camp's Ecuadorian collections, and a pasticcio from Peru. Also begun here are the minor adjustments needed to align finally the Melastomataceae for the Flora de Venezuela so as to accord with my crotchets.

MACAIREA LASIOPHYLLA (Benth.) Wurdack, comb. nov.

Chaetogastra lasiophylla Benth., Hook. Journ. Bot. 2: 291. 1840.

Pterolepis lasiophylla (Benth.) Triana, Trans. Linn. Soc. Bot. 28: 40. 1871.

Tibouchina lasiophylla (Benth.) Cogn., Mart. Fl. Bras. 14 (3): 297. 1885.

Acisanthera erecta Gleason, Bull. Torrey Club 58: 412. 1931.

Acisanthera lasiophylla (Benth.) Gleason, Phytologia 3: 243. 1950.

Siphantheropsis williamii Brade, Inst. Nac. Pesqu. Amaz. Publ. Bot. 8: 6. 1958.

One of the fortunate circumstances for scientists in botanical taxonomy is that plants, unlike wives and some other fauna, cannot protest the bandying to which they are subjected. A mute witness to the generic problems in the melastomes is the above-cited depauperate phyton. However, the pubescence and floral features indicate that M. lasiophylla represents a reduced evolutionary offshoot related to M. multinervia Benth., with stamens really quite conformable to other species in the genus. R.I.P.

TIBOUCHINA MARIAE Wurdack, sp. nov.

Sect. Diotanthera. T. laxae (Desr.) Cogn. affinis, sed calycis lobis intus glabris vel in apicibus ultimis sparse pilis glanduliferis ornatis.

Ramuli teretes demum rotundato-quadrangulati sicut inflorescentia sepala extus hypanthiaque modice vel densiuscule pilis erectis gracilibus laevibus glanduliferis 1-2(3.5) mm longis setosi, ramis infra pilis non glanduliferis. Petioli 0.3-1 cm dense breviterque setosi pilis gracilibus non glandulosis;

lamina 3-5.5 X 2-3.5 cm firme membranacea integra vel obscure crenulato-serrulata late ovata vel elliptico-ovata apice late hebeti-acuto vel acuto basi rotundata vel paulo (ad 4 mm) cordata 7-9-nervata nervis secundariis 2-4 mm inter se distantibus nervulis laxiuscule reticulatis, supra modice longo-setulosa pilis gracilibus laevibus 0.7-1.2 mm longis paulo appressis, subtus in nervis primariis dense longo-setulosa in nervulis superficieque modice vel sparse setulosa. Panicula terminalis plerumque 5-12-flora; flores 5-meri, bracteis foliaceis, pedicellis 1-3 cm longis plerumque ad medium vel paulo supra articulatis et bibracteolatis, bracteolis ca. 2 X 1 mm setulosis demum caducis. Hypanthium (ad torum) 5-7 X 3.5 mm; calycis tubus 1 mm altus, lobis 5-7 X 2-3 mm oblongis apice late hebeti-acuto intus glabris vel in parte 1/5-1/3 apicali sparse glanduloso-setulosis basim versus glabris. Petala 16-22 X 13-17 mm obovata apice asymmetrice rotundato vel truncato densiuscule ciliolata ciliis glanduliferis 0.2-0.3 mm vel apicem versus usque ad 0.7 mm longis. Stamina dimorphica glabra; filamenta 12-15 mm vel 8.5-10 mm; antherarum thecae 9-12.5 mm vel 6.5-8 mm subulatae, connectivo basi 3.5-5 mm vel 1-1.5 mm prolongato ventraliter 1.2-1.3 mm incrassato et bilobulato. Stylus 16 X 1 mm glaber; stigma truncatum non expansum; ovarium apice densiuscule striguloso pilis non glanduliferis, lobis apicalibus 2 mm altis.

Type Collection: J. J. Wurdack 632 (holotype US 2404208; isotype USM; 12 additional isotypes to be distributed), collected in Quebrada Molina 5 km below Chachapoyas, Prov. Chachapoyas, Depto. Amazonas, Peru, elev. 2200 m, 30 May 1962. "Lax shrub 1-4 m, locally frequent in moist ravine at forest edge. Petals magenta; anthers purple with yellow connective prolongation."

Paratypes (all Peru): Cajamarca: Cerros de Cutervo, Ferreyra 814; Cutervo, Ferreyra & Acleto 15374. Amazonas: Puma-urcu, Soukup 4048; Pomacocha, Ferreyra & Acleto 15171; Pomacocha-Yambrasbamba, Ferreyra & Acleto 15223; Chachapoyas-Cáclic, López Miranda, Sagástegui, & Collantes 4353; Cerros Calla-Calla, Hutchison & Wright 5649.

The epithet chosen commemorates my botanical artist and plant nurse, who grew the species from seed to flowering size. From the plants cultivated at Beltsville, P. G. Raven has obtained a mitotic chromosome number (to be published elsewhere). Through F. G. Meyer, seeds were also distributed to various botanic gardens. Tibouchina mariae is perhaps the most abundant melastome in the uplands of Depto. Amazonas. In cultivation, it is readily propagated by cuttings. While the flowers are very attractive, the sprawling habit, with rooting at the nodes, detracts from possible use as a house plant.

The typical element in T. laxa has roughened cauline and hypanthial hairs which are eglandular, as well as calyx lobes inside moderately strigulose nearly or quite to the torus (and usually 3-5 mm or more wide). Dr. Alicia Lourteig kindly furnished notes on the Jussieu holotype at Paris (see Macbride photograph 36166). After examining a type sprig (BR) of

T. cymosa Cogn. and also the holotype (US) of T. asperipilis Blake, I can see no reason for any separation from typical material of T. laxa. I have not found any valid publication of T. laxa var. villosissima Cogn., cited by Macbride in the Flora of Peru. Lehmann 4926, from near Cuenca, Ecuador, was annotated by Cogniaux in his own herbarium with this varietal name; since the Lehmann collection shows roughened hypanthial hairs, there will be no validation by me of this varietal name. In addition to the synonymized types above cited and the other material known to Cogniaux, 19 recent collections quite conform to Jussieu's specimen; in this typical form, T. laxa ranges from Oro, Cañar, Azuay, and Loja in Ecuador to Piura and Cajamarca (but not Amazonas) in Peru.

There are two other not too clearly defined variants of T. laxa; one shows smooth (or nearly so) but eglandular hairs (Ecuador: Cañar: Biblian, Asplund 17644; Asorgues, Balls 7083. Azuay: Susudal, Asplund 17814. Peru: Cajamarca: Colasay, Woytkowski 6908), while the other has roughened and gland-tipped hypanthial hairs (Ecuador: Guayas: 118 km east of Guayaquil, Maguire & Maguire 44266. Loja: San Pedro, Townsend A105. Peru: Piura: Ayabaca, Soukup 4299; Abra de Porculla, Ferreyra 13752. Cajamarca: Hualgayoc, Soukup 3853). The two forms are by no means as sharply delimited from the typical element of the species as these specimen citations would indicate, there being variability in abundance of glandulosity and degree of trichome roughening.

Apart from the collections cited above for T. mariae, two specimens from Huambos, Cajamarca, Peru, seem best placed in this species, although one (Soukup 4479) lacks gland-tipped hairs and the other (Ferreyra 8436) has very sparse glandular hairs on the pedicels and hypanthia. The Ecuadorian T. pendula Cogn. resembles T. mariae in calyx lobes, but has essentially isomorphic stamens with very short connective prolongation and hypanthial hairs very slightly roughened and eglandular.

TIBOUCHINA WEBERBAUERI Cogn.

After comparison with Weberbauer 5002 (BR), a series of recent Cuzco collections have been referred to T. weberbaueri: Prov. Convención, Vargas 3461, 13178, 13258; Prov. Urubamba, Vargas 3378. As cited by Macbride in the Flora of Peru, Mexia 8056 is also this species. Two features not noted in the original description are the predominance of 4-merous flowers and the sepals adaxially strigulose apically. The dissected flower in the inner packet of the Cogniaux Herbarium isotype is not from Weberbauer 5002, being 5-merous and with gland-tipped hypanthial and calycine hairs. Both T. decora Gleason and T. tetrapetala Cogn. are closely related to the Cuzco species; the former has 5-merous flowers, while the latter (Bang 2425, US) has minutely barbellate (rather than smooth) cauline hairs.

ERNESTIA KARURUANA Wurdack, sp. nov.

E. tenellae (Bonpl.) DC. affinis, indumento hispido in foliis ramulisque plerumque 3-4 mm longo foliis subsessilibus.

Suffrutex; ramuli obscure quadrangulati sicut folia inflorescentiaque modice pilis laevibus gracilibus erectis (2-)3-4 mm longis armati, pilis in ramulis inflorescentiisque plerumque glanduliferis in foliis plerumque non glandulosis. Petioli ca. 0.2 cm; lamina 2-2.5(-3) X 1-2 cm ovata vel oblongo-ovata apice paulo acuminato basi cordulata 5-7-nervata fragilis setoso-serrulata. Paniculae 6-13 cm longae multiflorae; pedicelli 2.5-3 mm longi; flores 4-meri. Hypanthium (ad torum) 2.5 X 1.7 mm modice pilis glanduliferis gracilibus 1.5-2 mm longis obsitum; calycis tubus 0.3 mm altus, lobis 4.3-4.5 X 0.7 mm anguste lanceatis apice setiferis. Petala 9.5-10.5 X 6-8 mm asymmetrice elliptica quaeque apice setula unica armata. Stamina dimorphica glabra, filamentis 5.5 mm vel 3.5 mm longis, antheris poro terminali minuto ventraliter inclinato dehiscentibus. Stamina maiora: thecae 5.5 mm longae, connectivo infra thecas usque ad calcar dorsale 4 mm prolongato, calcar dorsali 0.3 mm longo et 0.6-0.7 mm supra filamenti insertionem inserto, aristis duabus ventralibus 3.8-4.3 mm longis basi 0.3 mm coalitis simplicibus vel interdum unibarbellatis. Stamina minora: thecae 4 mm longae, connectivo infra thecas usque ad calcar dorsale 0.5 mm prolongato, calcar dorsali 0.4 mm longo et 0.2 mm supra filamenti insertionem inserto, aristis duabus ventralibus 2.7 mm longis basim versus per 0.5 mm paulo incrassatis simplicibus usque ad basim divisis. Stylus 8.5 X 0.2 mm glaber; stigma truncatum; ovarium 3-loculare apice setulis paucis (ca. 8) glanduliferis 0.4-1.3 mm longis coronato.

Type Collection: R. E. Schultes & I. Cabrera 19176 (holotype GH; isotypes NY, US), collected in Savannah Goo-ran-hoo-dá, Mesa de Yambi, Río Karurú, 1°20' N, 71°20' W, Vaupés, Colombia, elev. 290-300 m, 15-16 April 1953. "Flowers white."

Ernestia tenella and the other species with puberulous ovaries (E. ovata Cogn., E. quadriseta Berg ex Triana, E. adenotricha Uribe) have dense cauline hairs less than 1 mm long, foliar hairs less than 2 mm long, and distinctly developed petioles 0.5-2.5 cm long. As previously indicated (Mem. N. Y. Bot. Gard. 10, pt. 5: 136. 1964), at least part of E. tenella shows predominantly 3-locular ovaries. The long hairs of E. karuruana suffice as a species distinction from all congeners. All of the two flower ovaries and six fruit capsules visible on Schultes & Cabrera 19176 showed 3 cells.

MONOCHAETUM HUMBOLDTIANUM (Kunth & Bouché) Kunth ex Walpers var. HIRTUM (Karst.) Wurdack, comb. nov.

Grischowia hirta Karst., Ausw. Neue Gew. 16, pl. 5. 1848.

Monochaetum hirtum (Karst.) Triana, Trans. Linn. Soc. Bot. 28: 64. 1871.

Monochaetum brevifolium Gleason, Am. Journ. Bot. 16: 522. 1929.

No specific distinctions based on pubescence posture or density are possible in the abundantly collected species of the Venezuelan Coastal Cordillera. If the Pico Naiguatá samplings are indicative, the higher elevation (of more exposed habitats?) plants have denser and erect stem hairs. In addition to the collections cited in 1929 for M. hirtum and M. brevifolium, var. hirtum is also now represented by Steyermark 62961 from Naiguatá and Killip & Rohl 37161 and 37204 from between El Junquito and Agua Negra (D.F.), as well as the following originally cited by Gleason as typical M. humboldtianum: Pittier 8130 from the headwaters of the Chichiriviche and Petaquire Rivers and Pittier 6261 from Naiguatá. Pittier 6279, from the lower slopes of Naiguatá, is intermediate between the varieties, while Delgado 58 (from Rancho de Boqueron) varies slightly from var. humboldtianum toward var. hirtum. Steyermark 61589 from Anzoátegui (cited in Fieldiana Bot. 28: 1037. 1957 as M. hirtum) actually represents M. bonplandii (Kunth) Naud., with sepals tardily deciduous in late fruit; vegetatively M. bonplandii is distinguishable from M. humboldtianum var. hirtum by the much denser and finer cauline and foliar pubescence.

MONOCHAETUM HUMBOLDTIANUM (Kunth & Bouche) Kunth ex Walpers var. CHARDONII Wurdack, var. nov.

A var. hirto differt foliis supra densiuscule aequaliterque brevistrigosis pilis gracilibus 12-14/mm quad.

Type Collection: C. E. Chardon 201 (holotype US 1801626), collected along the highway to Choroni, Edo. Aragua, Venezuela, elev. 1200 m, 26 Oct. 1940.

Paratype: G. Ferrari 72 (Herb. Maracay), from "cumbre de la carretera de Choroni," Edo. Aragua, Venezuela, elev. 1500 m.

Both other varieties have upper leaf surface hairs 1-3/ sq. mm and in distinct strips, with longitudinal glabrous areas along the primary veins. Despite the marked disparity in foliar pubescence, no floral distinctions are apparent; the cauline pubescence is erect as in var. hirtum.

MONOCHAETUM GLEASONIANUM Wurdack, sp. nov.

Sect. Grischowia. M. lindeniano Naud. affinis, sed ramulorum pubescentia parciore hypanthiis sparse gracili-strigulosis staminis maioris appendicibus crassioribus hebetibus.

Frutex; ramuli teretes vel sulcato-quadrangulares sicut petioli foliorum venae primariae subtus sparse vel modice laxo-strigulosi pilis gracilibus laevibus, in nodis gracili-setosi. Petioli 0.5-1 cm; lamina 2-4 X 1-2 cm ovato-elliptica apice acuto vel paulo acuminato basi late acuta, breviter 5-plinervia pare interiore 1-3 mm supra basim inserto nervis secundariis supra occultis, supra in lineis inter nervos sparse gracili-strigosa pilis 1-2 mm longis, subtus in superficie sparse laxostrigulosa. Flores in dichasiis terminalibus 1-3-floris dispositi; pedicelli 0.5-1 cm longi sicut sepala extus hypanthi-aque sparse strigulosi pilis gracilibus 0.3-0.5 mm longis.

Hypanthium (ad torum) 6 mm longum extus in tori regione sparse pilis suberectis gracilibus 1-2 mm longis armatum; sepala 6-7 X 2 mm post anthesim decidua lanceata acuta ciliolata. Petala non visa. Stamina glabra, filamentis 5 mm longis. Stamina maiora: antherarum thecae 4 mm longae, appendice dorsali 3.5-4 X 0.5 X 0.7 mm apice rotundato. Stamina minora: antherarum thecae 4 mm longae, appendice dorsali 3.5 X 0.3 mm circum medium 1 mm lata et paulo auriculata apice hebeti-acuto. Stylus 8 X 0.4 mm glaber; ovarii apex pilis p. p. glanduliferis modice armatus.

Type Collection: Ernest Reed (Syracuse University Andean Expedition) 32 (holotype US 1618468), collected in terrace alluvium at Chachapo, Edo. Mérida, Venezuela, elev. 2620 m, 18 Jan. 1931.

Paratype: Reed 48, from the same locality.

Monochaetum lindenianum has dense spreading cauline pubescence, upper leaf surface hairs in strips exceeding the glabrous vein bands, moderately short-strigose or long-strigulose or appressed-setose hypanthia (hairs averaging 1-1.5 mm in length), and acute or acuminate anther appendages. Monochaetum meridense (Kl. ex Karst.) Naud. has sparser foliar pubescence and linear (sterile) small anthers, while M. laxifolium Gleason shows 7-plinerved leaves with shorter (ca. 0.5-0.7 mm long) upper surface hairs, essentially glabrous eciliate sepals, and isomorphic stamens. The other species of Gleason's group Lindenianae, M. ciliatum Gleason, has sparsely fine-setose branches and longer hypanthial hairs. The general vegetative aspect of M. gleasonianum is like that of M. lineatum (D. Don) Naud. which, however, has persistent sepals and filiform small anther appendages. Dr. Gleason had annotated the Reed collections as probably undescribed and had noted the affinity with M. lindenianum.

AXINAEA TOVARII Wurdack, sp. nov.

A. sclerophyllae Triana et A. tomentosae Cogn. affinis, sed foliis proportionaliter angustioribus subtus demum glabratis.

Ramuli primum quadrisulcati demum rotundato-quadrangulati sicut petioli foliorum venae primariae hypanthia (basim versus) inflorescentiarum rami pedicellique primum dense pilis barbellatis 0.4-0.7 (-1) mm longis erectis armati demum glabrati. Petioli 3.5-5.5 cm; lamina 11.5-21.5 X 3.5-8.5 cm subcoriacea basim versus integra apicem versus inconspicue serrulata (dentibus 0.2-0.3 mm altis et 5-9 mm inter se distantibus) elliptica apice per 1-2 cm gradatim hebeti-acuminato basi acuta (basi ipsa paulo rotundata), 5-nervata vel paulo (usque ad 5 mm) 5-plinervata (jugo debili inframarginali neglecto) nervis secundariis ca. 3 mm inter se distantibus sicut nervulis supra et subtus paulo elevatis nervulis sublaxe reticulatis areolis ca. 1 mm latis, supra glabra, subtus in nervulis superficieque primum sparse puberula pilis barbellatis crassis 0.1-0.3 mm longis demum glabrata. Panicula 7-10 X 7-9 cm ramis paulo deflexis, pedicellis 2-5 X 1 mm, bracteolis 0.5-0.7 X 0.3 mm oblongis caducis ob pilos fere occultis; flores 5-meri. Hypanthium (ad torum) 5.5 X 7.5 mm;

calyx 2 mm altus subglaber limbo integro, dentibus exterioribus inconspicuis 0.5 mm longis hebetibus vix elevatis. Petala 16-17 X 9.5-10 mm glabra oblongo-obovata apice asymmetrice rotundato et inconspicue retuso. Filamenta 8-9 mm glabra; antherarum thecae 4.5-5.5 mm longae oblongo-subulatae poro minuto dorsaliter inclinato, appendice dorsali inflata 3-4 X 2-2.5 mm apice hebeti. Stylus 22 X 1.7-0.8 mm in ovarii apice 1.5 mm immersus; stigma 0.8 mm latum; ovarium 5-loculare glabrum apice 5-lobulato lobulis 0.7-1 mm longis et 0.3-0.6 mm retusis.

Type Collection: Oscar Tovar 4753 (holotype US 2446955; isotype USM), collected in ceja de montana at Marcavalle, between Huachocolpa and Tintay, Prov. Tayacaja, Depto. Huancavelica, Peru, elev. 2700 m, 20 April 1964. "Arbol 7-10 m. Flores purpúreas."

Both suggested relatives have leaf blades with length/width ratio mostly 1.5-2 (rather than 2.5-3.2), as well as persistently puberulous lower surfaces. Axinaea sclerophylla has considerably larger hypanthia and A. tomentosa shows slightly deflexed leaf base auricles. Both A. pennellii Gleason and A. weberbaueri Cogn., with leaf blades distinctly serrulate and basally auricled, are more distant relatives; the former species has essentially glabrous hypanthia, while the latter has quite small hypanthia.

MERIANIA BRITTONIANA Wurdack, nom. nov.

Axinaea speciosa Britton, Bull. Torrey Club 17: 57. 1890, non M. speciosa (Bonpl.) Naud.

MERIANIA CUZCOANA Wurdack, sp. nov. 3702

M. brittonianae Wurdack affinis, sed ramulis novellis inflorescentiisque glaberrimis foliis subtus non furfuraceis trinervatis.

Ramuli primum indistincte quadrangulati demum teretes, sicut folia inflorescentiae hypanthiaque glabri. Petioli 2-2.5 cm graciles; lamina 5.5-9.5 X 2.5-3.2 cm tenuiter coriacea integra elliptica vel paulo oblongo-elliptica apice acuto basi obtusa (basi ipsa plerumque rotundata et auriculato-recurvata per 1-2 mm), trinervata nervis primariis lateralibus basim versus per 2-3 mm costa parallelis nervis secundariis tenuibus inconspicuis ca. 1 mm inter se distantibus nervulis inconspicuis anastomosantibus (areolis 0.3-0.5 mm latis), subtus sparse puncticulata punctulis primum nigro-rubris demum nigris. Panicula 8-10 cm longa submultiflora; flores 5-meri, pedicellis 1.5-2 cm longis ad medium vel paulo supra articulatis, bracteolis delapsis non visis. Hypanthium (ad torum) 8.5-9 mm altum glabrum; calycis limbus 1.5 mm altus integer extus glaber intus dense resinoso-granulosus, dentibus exterioribus inconspicuis carnulosis 0.3-0.5 mm eminentibus. Petala 24-26 X 18 mm glabra obovata apice asymmetrice rotundato-truncato. Stamina isomorphica glabra; filamenta 12.5-13 mm; antherarum thecae deflexae 8-8.5 mm longae, connectivo infra filamenti insertionem in calcari crassiusculo 3.5 mm longo (distaliter per 0.5 mm subabrupte hebeti-caudato) et dorsaliter dente ascendente hebeti crassiusculo 0.5 mm libero armato. Stylus 11-15 X 0.9-0.5 mm glaber in

ovarii apice 0.7-1 mm immersus; stigma truncatum non expansum; ovarium 5-loculare glabrum apice lobulis 5 breviter emarginatis 0.7 mm longis armato.

Type Collection: C. Vargas C. 5107 (holotype US 2438729; isotype CUZ), collected in "laderas boscosas de Pillahuata," Prov. Paucartambo, Depto. Cuzco, Peru, elev. 2000 m, 9-10 May 1945. "Arbusto 6-8 m. Corola rojo-púrpura oscuro."

Meriania brittoniana has distinctly plinerved leaves (the inner pair of primary lateral veins diverging 1-1.5 cm above the blade base) and caducously stellulate- or pinoid-furfuraceous young branchlets and inflorescences. From the general facies, both species should probably be aligned with the 6-merous M. hexamera Sprague and M. huilensis Wurdack. The sectional delimitations now used in Meriania are obviously artificial, but surely the four above-discussed species belong near M. rigida (Benth.) Triana. Although Eves in his revision of Axinaea accepted Britton's generic placement of M. brittoniana without discussion, the stamens in this species lack a connective sac and are very like those of the suggested relatives in Meriania. Britton's epithet is unavailable in Meriania, having been preoccupied in M. speciosa (Bonpl.) Naud.

3263 MERIANIA VARGASII Wurdack, sp. nov.

In staminum characteribus M. calophyllae (Cham.) Triana et M. arboreae (Naud.) Triana affinis, sed foliis tenuioribus late oblanceolatis 5-plinervatis hypanthii pilis longioribus differt.

Ramuli primum sulcato-quadrangulati demum subquadrangulati sicut petioli inflorescentiaque pilis 0.5-1 (in nodis usque ad 2) mm longis basim versus paulo barbellatis interdum minute caduceque glanduliferis armati tarde glabrati. Petioli ca. 1.5 cm; lamina 16-20 X 5-7 cm membranacea apicem versus serrulata (dentibus 3-4 mm inter se distantibus et ca. 1 mm altis) late oblanceatis apice paulo hebeti-acuminato basi attenuata (basi ipsa abrupte rotundata), 5-plinervata (pare tenui exteriore inframarginali neglecto) pare interiore 0.7-1.5 cm supra basim inserto nervis secundariis 4-7 mm inter se distantibus tertiariis planis laxiuscule reticulatis, supra glabra, subtus in nervis primariis secundariisque modice et in nervulis sparsiuscule pilis gracilibus 1-1.5 mm longis basim versus paulo barbellatis interdum glanduliferis armata in superficie glabra. Pedunculus 6 cm; panicula racemiformis pauciflora, bracteis bracteolisque caducis non visis; pedicelli ca. 1 cm longi ad medium articulati; flores 5-meri. Hypanthium (ad torum) 8-9 mm longum sicut sepala dense sericeostrigosum pilis basim versus densiuscule barbellatis; calycis tubus 2.5-3 mm altus, lobis interioribus membranaceis 7-7.5 mm longis apice rotundato, dentibus exterioribus acutis quam lobos interiores 5-6 mm longioribus. Petala 20-24 X 14-18 mm obovata apice rotundato-truncato. Stamina paulo dimorphica glabra, filamentis 13 vel 12 mm longis, antherae poro apicali paulo dorsaliter inclinato. Stamina maiora: antherarum thecae 12 mm longae, cornu basali 3 mm longo, appendice dorsali ascendente 1.5 mm longa. Stamina minora: antherarum thecae 9 mm longae, cornu basali

2.5 mm longo, appendice dorsali ascendente 0.5 mm longa. Stylus 15 X 0.8-0.6 mm glaber in ovarii apice 1.4 mm immersus; stigma truncatum 0.8 mm latum; ovarium glabrum apice paulo (0.4 mm) lobulato.

Type Collection: C. Vargas C. 13240 (holotype US 2438703; isotype CUZ), collected at Hacienda Guayanay, Prov. Convención, Depto. Cuzco, Peru, elev. 1800 m, 15 May 1960. "Arbusto 3 m in bosques secundarios."

While the ascending dorsal connective appendages would place M. vargasii in Sect. Adelbertia Triana, probably genetically closer relatives are to be found in Sect. Umbellatae among such species as M. steyermarkii Gleason, M. quintuplinervis (Karst.) Naud., and M. cuneifolia Gleason. Meriania boliviensis Cogn., placed originally in Sect. Meriania but later in Sect. Umbellatae, was illustrated by Gleason (Phytologia 2: 295. 1947); this illustration shows a distinct dorsal ascending tooth on the anther connective. The Bolivian species differs from M. vargasii in the shorter sparser pubescence and elliptic markedly pli-nerved leaves (the inner pair of primary lateral veins diverging from the costa 2.5-3.5 cm above the blade base). Both M. arborea and M. calophylla have considerably thicker basally nerved elliptic leaves; the former species has reticulate-bullate upper leaf surfaces, while the latter shows very short hypanthial pubescence.

Vargas 10644 (US), from Tunquimaya, Prov. Convención, Cuzco, is certainly conspecific with M. vargasii and, in vegetative features, agrees quite well. However, the flowers of the Tunquimayo specimen are somewhat smaller and the totally adnate external calyx teeth are not emergent (about 1 mm shorter than the calyx lobes); the large anthers have a distinct ascending dorsal tooth on the connectives, while the small anthers have only the barest suggestion of such a tooth. I hesitate to formally describe a variety without further collections.

MICONIA LITTLEI Wurdack, sp. nov.

Sect. Tamonea. M. longicaudatae Cogn. et M. leucanthae Gleason affinis, sed floribus minoribus.

Arbor 6-15 m alta; ramuli primum sulcato-quadrangulati demum teretes sicut petioli inflorescentia pilis stellulatis vel paulo pinoideis vix 0.1 mm altis minutis densiuscule furfuracei demum glabrati. Petioli (2-)3-7.5 cm longi graciles; lamina (acumine excluso) (9-)12-21 X 5-14 cm tenuis inconspicue undulato-serrulata apice subabrupte per 2-4 cm caudato-acuminato basi late obtusa, 5-nervata (pare debili inframarginali neglecto) nervis secundariis 5-7 mm inter se distantibus subtus creberrime elevatis nervis tertiariis subtus paulo elevatis nervulis subtus planis et creberrime reticulatis (areolis irregularibus 0.2-0.4 mm latis), supra glabra, subtus in nervis primariis primum modice pinoideo-furfuracea pilis 0.2 mm longis tarde glabrata in nervis secundariis primum sparse stellulato-puberula mox glabrata in superficie glabra. Panicula 7-10 (vel in statu fructifero usque ad 15) cm longa pyramidata multiflora; flores 5-meri,

pedicellis ca. 1.5 mm longis plerumque ad medium articulatis, bracteolis 0.5-0.6 X 0.1 mm linearibus valde caducis. Hypanthium (ad torum) 1.9 mm longum extus densiuscule minutissimeque stellulato-puberulum; calycis tubus 0.3 mm altus, lobis interioribus 0.8 mm altis late ovatis apice hebeti-acuto, dentibus exterioribus inconspicuis omnino adhaerentibus non eminentibus. Petala 2.8 X 2 mm extus centraliter modice granulosa obovata apice asymmetrice rotundato. Filamenta 2.3-2.6 mm modice pilis glanduliferis 0.1 mm longis ornata; antherarum thecae 2.3-2.5 X 0.4 mm oblongo-subulatae minute porosae, connectivo simplici non prolongato. Stylus 3.5 X 0.45 mm basim versus densiuscule glanduloso-puberulus pilis 0.05 mm longis in ovarii apice paulo immersus; stigma capitellatum 0.7 mm diam.; ovarium 3-loculare 1/3-inferum superne costatum in angulis apicem versus modice puberulum pilis 0.05 mm longis non glandulosis; fructus sphaeroideus 3-3.5 mm diam. paulo 10-costatus.

Type Collection: E. L. Little 6177 (holotype US 1877635), collected in wet tropical forest 12 km west of Santo Domingo de los Colorados on the trail to Rancho Grande, Prov. Pichincha, Ecuador, 5 April 1943. "Small tree 20 ft., DBH 3 in. Flowers white to pink. Vern. name: Colcha."

Paratypes (all from Prov. Esmeraldas, Ecuador): 4 km west of Borbón, Little 6380 (US); across Río Quinindé from Quinindé, elev. 65 m, Little 6249 (US); right shore of Río Esmeraldas opposite Quinindé (Rosa Zarate), Asplund 16338 (S); "Carretera Santo Domingo de los Colorados-Quinindé, km 171-188, hasta el Río Cócola, alt. 100 m.s.m.," Acosta Solis 16219 (F).

Both suggested relatives have hypanthia plus calyx lobes 3.5-4 mm long and petals 4-6 mm long; the Venezuelan and Costa Rican populations are dubiously distinct from one another. The Peruvian M. doneana differs from M. littlei in the much larger prominently bracteate flowers; a recent collection of M. doneana is Schunke A118 (US), from Schunke Hacienda above San Ramón, Junín. Miconia caudata (Bonpl.) DC. has persistently furfuraceous lower leaf surfaces and slightly larger flowers with oblate calyx lobes only 0.3-0.5 mm long.

MICONIA CERCOPHORA Wurdack, sp. nov.

Sect. Tamonea. A speciebus 22-25 et 36 Monographiae Cogniauxii foliis supra strigulosis differt.

Ramuli primum sulcato-quadrangulati demum teretes sicut petioli foliorum venae primariae subtus inflorescentia hypanthiaque modice furfuracei pilis stellulatis vel paulo pinoideis 0.1 (-0.2) mm longis. Petioli 3.5-6.2 cm; lamina (acumine excluso) 14-18.5 X 7.5-10.5 cm tenuis indistincte undulato-serrulata ovato-elliptica apice subabrupte per 2-3 cm caudato-acuminato basi late obtusa, 5-nervata (pare inframarginali debili neglecto) nervis secundariis 3-5 mm inter se distantibus supra planis subtus creberrime elevatis nervulis subtus planis et reticulatis areolis 0.2-0.3 mm latis, supra sparse setulosa pilis simplicibus ca. 1 mm longis et 1/mm quad. laxis, subtus in nervulis minute granulosa in superficie glabra. Panicula 15 X 10 cm pyramidata

submultiflora; flores 5-meri, pedicellis 1(-2) mm longis robustis, bracteolis 1.1-1.7 X 0.3-0.5 mm caducis. Hypanthium (ad torum) 1.3 mm altum; calycis tubus 0.4 mm altus, lobis interioribus 0.3 X 1.2-1.3 mm oblatis apice rotundato-truncato, dentibus exterioribus acutis 0.1-0.15 mm eminentibus. Petala 5 X 3-3.5 mm oblongo-obovata apice rotundato et asymmetrice retuso, extus centraliter modice stellulato-puberula intus minutissime granulosa. Stamina glabra in dimensionibus paulo anisomorphica; filamenta 5-5.8 mm; antherarum thecae 5.4 X 0.9 X 1 mm vel 4.9 X 0.7 X 0.8 mm margine convoluto apice minute (0.2 mm) uniporoso, connectivo dorsaliter 0.3-0.4 vel 0.1 mm prolongato truncato. Stylus 12 X 0.6 mm glaber in ovarii apice 0.4 mm immersus; stigma capitellatum 1.1 mm diam.; ovarium 3-loculare 1/6-inferum apicem versus minutissime granulosum.

Type Collection: E. Asplund 19526 (holotype S), collected in rastrojo at Shell Mera, Prov. Napo-Pastaza, Ecuador, elev. 1000 m, 1 Mar. 1956. "Shrub about 3 m high, calyx pale green, petals white, anthers pink."

All of the species of Miconia in Sect. Tamonea with caudate-acuminate leaf blades have the upper leaf surfaces glabrous. Apart from the leaf pubescence and glabrous filaments, M. cercophora resembles in general aspect M. leucantha Gleason and M. longicaudata Cogn. Miconia ciliaris Triana has upper leaf surface pubescence similar to (albeit slightly longer than) that of M. cercophora, but differs in the apically gradually acuminate and basally cordulate leaves, as well as (ex descr.) the glandular-puberulous filaments and style. Two recent Peruvian collections (US), unfortunately not in flower, of M. ciliaris are Killip & Smith 24739 (San Ramón, Junín) and 24959 (Colonia Perene, Junín).

MICONIA MITUANA Wurdack, sp. nov.

In systema Cogniauxii M. aureoidei Cogn. affinis, sed petiolis foliis juvenilibus supra inflorescentiisque sparse setulosis foliis 7-nervatis bracteis maioribus.

Ramuli primum quadrisulcati demum teretes sicut petioli foliorum laminae subtus inflorescentia bracteae extus hypanthiaque dense stellulato-furfuracei et (sicut petioli foliorum venae primariae subtus inflorescentiae rami pedicellique) sparse vel modice setulosi pilis erectis laevibus usque ad 1 mm longis in inflorescentia p. p. glanduliferis. Petioli 3-6.5 cm; lamina 10-15.5 X 6.5-11 cm tenuiter coriacea indistincte sinuato-denticulata ovato-elliptica apice per ca. 1 cm subabrupte hebetiacuminato et mucro 1-2 mm longo terminato basi rotundata vel inconspicue (ad 3 mm) cordulata, 7-nervata (pare tenui inframarginali neglecto) nervis secundariis 4-5 mm inter se distantibus sicut nervis tertiariis subtus creberrime elevatis nervulis reticulatis (areolis 0.3-0.5 mm latis) sed ob indumentum occultis, supra primum sparse brevisetosa (pilis 1-1.5 mm longis simplicibus laevibus i. s. luteis) demum glabrata densissime granulis albidis immersis obsita. Panicula 9-13 cm longa ramis primariis in nodis 4-6-verticillatis, ramulis ultimis plerumque 5-verticillatis; flores 6-meri, pedicellis ad anthesim 8-10 mm longis;

bracteae duae ad hypanthii basim insertae 9-10 X 6 mm obovato-ellipticae ad anthesim caducae intus sparse vel modice stellulato-puberulae. Hypanthium (ad torum) 5.5 mm; calyx ca. 3.5-3.8 mm altus ad anthesim in lobis 3-4 irregulariter dehiscens extus modice et intus sparse stellulato-puberulus, dentibus exterioribus invisis; torus pilis stellulato-fasciculatis 0.3-0.5 mm longis ornatus. Petala 8.5 X 4 mm apicem versus graciliter ciliolata alioqui glabra obovato-oblonga apice cucullato et paulo retuso. Stamina isomorphica glabra; filamenta 9-10 mm; antherarum thecae 11.5-12 mm longae subulatae, connectivo dorsaliter basim versus per ca. 3 mm paulo elevato ventraliter minute (0.5 mm) bilobulato. Stylus 15 X 0.4-0.8 mm centraliter sparsissime stellato-puberulus; stigma capitellatum 1.7 mm diam.; ovarium 4-loculare vix (1/10) inferum basim versus glabrum apice in collo argenteo-strigilloso 1.2 mm alto circum stylum protracto.

Type Collection: Bassett Maguire, Celia K. Maguire, & Alvaro Fernandez 44089 (holotype US 2325852; isotypes COL, NY), collected at woodland edge, Cerro Mitú, Vaupés, Colombia, elev. 400 m, 4 Sep. 1959. "Tree to 10 m; petals pink or orange-red at base; stamens wholly yellow. Occasional."

Miconia aureoides has stem, foliar, and inflorescence pubescence of short thick pinoid hairs, 3- or faintly 5-plinerved leaves, ovate bracts only about 2 mm long, and much shorter anthers. An isotype (NY) of M. aureoides shows both filaments and style puberulous and the stamen connective basally with lateral sessile glands; thus, despite the irregularly lacerate calyx, probably M. glandulifera Cogn. and M. ciliaris Triana are closer relatives than Cogniaux' arrangement would indicate. As suggested by Macbride, M. glandulifera is probably synonymous with M. muricata (D. Don) Triana. Miconia mituana has the general aspect of M. dodecandra (Desr.) Cogn. (as I had earlier and incorrectly named the Mitu collection), but that widespread species has a regularly lobed calyx and (usually) 5-nerved leaves which are glabrous above.

MICONIA CARPISHANA Wurdack, sp. nov.

Sect. Amblyarrhena. M. centrophorae Naud. in systema Cogniauxii affinis sed foliis integris.

Ramuli primum obtuse quadrangulati demum teretes sicut petioli inflorescentiaque dense furfuracei pilis usque ad 3 mm longis crassis dense asperis tarde glabrati. Petioli 0.5-1 cm; lamina 6-8 X 2.7-4 cm integra coriacea anguste ovata apice per 0.5-1 cm gradatim hebeti-acuminato basi obtusa vel rotundata, 5-nervata pare exteriore tenui inframarginali nervis secundariis 3-5 mm inter se distantibus subtus tenuibus et paulo elevatis nervulis obscure elevatis et crebre reticulatis, supra glabra, subtus in nervis nervulisque primum sparse furfuracea mox glabrata. Panicula 4-7 X 3.5-6 cm multiflora; flores 5-meri conferti 0.5-1.2 mm pedicellati, bracteolis 0.8-1.5 X 0.1-0.5 mm furfuraceis valde caducis. Hypanthium (ad torum) 1.6 X 1.8 mm sparse (vel basim versus modice) furfuraceum pilis appressis irregulariter stellulatis; calycis tubus 0.2 mm altus, lobis interioribus

0.4 mm altis rotundatis, dentibus exterioribus callosis non eminentibus. Petala 1.2-1.3 X 1.2-1.3 mm extus glabra intus minutissime papillosa suborbicularia apice rotundato. Stamina isomorphica glabra; filamenta 2 mm longa; antherarum thecae 1.4 X 0.5 X 0.5 mm oblongae apice dorsaliter inclinato et minute (0.15-0.2 mm) poroso, connectivo simplici vel dorsaliter dente hebeti 0.1 mm longo descendente ornato. Stylus 4 X 0.3 mm glaber apicem versus paullulo clavatus in ovarii apice 0.5 mm immersus; stigma truncatum 0.45 mm diam.; ovarium 2(?)-loculare 1/2-inferum apice conico glabro minute (0.2 mm) denticulato.

Type Collection: Bassett Maguire & Celia K. Maguire 44436 (holotype US 2444821; isotype NY), collected on the west side of Carpish Pass, Depto. Huánuco, Peru, elev. 2850 m, 22 Oct. 1959. "Tree to 5 m. Flowers white."

Miconia centrophora has denticulate leaf blades with conspicuous secondary veins, straight stiff trichomes mixed with the scurfy ones in the inflorescence, and a setulose ovary apex; M. chrysanthera Cogn. shows the same vegetative differences as M. centrophora, as well as longer pedicels. Miconia crassifolia Triana has denticulate leaf blades with conspicuous secondary and tertiary nerves on the lower surface, pedicels 1-3 mm long, and a densely fine-setulose calycine torus. Miconia pichinchensis Benth. has some simple branchlet hairs, ciliolate leaf blades, and sparsely glandular-puberulous filaments and style. Miconia ignaria Bonpl. ex Naud., keyed by Cogniaux to the species grouping around M. centrophora, actually is, because of its formless foliar pubescence, closely related to M. lutescens (Bonpl.) DC. In leaf texture, M. carpishana resembles M. obovata Triana and M. spatellophora Gleason. The former species differs at least in leaf shape and (if my tentative identifications of Pennell 3152 from Tolima and Bro. Tomas 2391 from Caldas are correct) the obovate broadly pored anthers (of Sect. Cremanium, rather than Sect. Amblyarrhena); the latter has oblong narrower leaves and shorter sepals.

MICONIA BENEOLENS Wurdack, sp. nov.

Sect. Amblyarrhena. M. tererae Naud. et M. cookii Gleason affinis, sed foliis minoribus inflorescentiae ramis ramulisque amorpho-furfuraceis.

Ramuli primum hebeti-quadrangulati demum teretes, primum sicut petioli inflorescentiaeque amorpho-furfuracei demum glabrati. Petioli 1-2 cm; lamina 4.5-7.5 X 2-4 cm subrigida integerrima elliptica vel paulo obovato-elliptica apice hebeti-acuto vel breviter (usque ad 0.5 cm) lateque hebeti-acuminato basi late acuta, breviter (2-3 mm) triplinervata nervis secundariis 1.5-2 mm inter se distantibus supra paulo impressis subtus inconspicue elevatis nervulis anastomosantibus areolis ca. 0.5 mm latis, supra glabra et nitidula, subtus in nervis primariis primum sparse amorpho-furfuracea mox glabrata alioqui glabra. Panicula 5.5-7 X 3.5-5 cm pyramidata multiflora; flores 5-meri (0.5-)1-2 mm pedicellati, bracteolis 0.7-0.8 X 0.1-0.15 mm in pedicelli medio vel paulo supra insertis valde caducis. Hypanthium (ad torum)

1.8-2 mm altum glabrum vel primum tenuiter amorpho-furfuraceum mox glabratum; calycis tubus 0.3-0.4 mm altus, lobis interioribus 0.4-0.5 mm altis oblongis vel oblongo-triangularibus apice rotundato et sparse furfuraceo, dentibus exterioribus obscuris non eminentibus. Petala 1.4-1.9 X 1.4-1.9 mm extus glabra intus granulosa suborbicularia paulo apice asymmetriceque retuso. Stamina isomorphica glabra; filamenta 1.7-2.1 mm; antherarum thecae 1.4-1.6 X 0.5-0.6 X 0.5-0.6 mm oblongae apice uniporoso (poro 0.1-0.15 mm diam. paulo dorsaliter inclinato), connectivo nec prolongato nec appendiculato. Stylus 4 X 0.3-0.4 mm glaber vel sparsissime glanduloso-puberulus in ovarii apice 0.5 mm immersus; stigma truncatum 0.5 mm diam.; ovarium 1/3-inferum apice conico 0.6 mm alto glandulis 5 et 0.05 mm longis coronato.

Type Collection: J. A. Steyermark 54789 (holotype US 1933469; isotypes F, NY), collected on the western slopes of the Cordillera Condor and northwest slopes of Nudo de Sabanillas around Tambo Cachiyacu, along Río Cachiyacu about 2 leagues southeast of Yangana, Prov. Loja, Ecuador, elev. 2000-3000 m, 19 Oct. 1943. "Tree 35 feet tall; flowers very fragrant; almost like rich perfume of lilac; filaments erect, straight, white; calyx pale green; anthers dull yellow; leaves subcoriaceous, deep green above, pale green below; petiole red; in forest with Cinchona officinalis "hoja de lucma."

Paratype: Reinaldo Espinosa E-1078 (F, NY), from Namanda, Loja, Ecuador, elev. 1500-1600 m, 24 Nov. 1946. "Arbusto coposo. Hojas coriáceas, brillantes, claras en el envés. Racimos florales muy apretados. Flores color blanco, cáliz amarillento. Crece in bosque achaparrado."

Both suggested relatives have leaf blades 10-22 cm long, as well as glabrous inflorescences. Miconia terera has smaller flowers (anthers ca. 1 mm long) and petals densely furfuraceous on both sides (see Klug 3223, distributed mistakenly as M. elongata Cogn.; Skutch 4476, distributed mistakenly as M. cookii; and Asplund 18365). Miconia cookii has laxer leaf venule areoles (ca. 1 mm across) than M. beneolens. Steyermark 54789 was distributed originally as M. crocea (Desr.) Naud., but is not at all closely related to that species. I was not able to determine the ovary-cell number from the available collections of M. beneolens.

MICONIA MOLINOPAMPANA Wurdack, sp. nov.

Sect. Cremanium. M. globuliflorae (Rich.) Triana in foliorum forma similis, sed ramulis primum rotundato-quadrangulatis, pedicellorum bracteis minoribus antheris biporosis differt.

Frutex 0.3-0.7 m altus glaber. Ramuli primum obscure quadrangulati demum teretes. Petioli 0.4-1.2 cm longi graciles; lamina 2.5-5 X 1.4-2 cm subcoriacea distincte ciliolato-serrulata ciliis incurvis crassis ca. 0.5 mm longis et ca. 1-1.5 mm inter se distantibus elliptica vel oblongo-elliptica apice acuto vel paulo (per 0.3-0.5 cm) hebeti-acuminato basi late acuta vel obtusa, trinervata (nervis primariis lateralibus interdum subtus

basim versus per 1-3 mm costa coalitis) nervis secundariis gracilibus supra et subtus planis vel paulo impressis 1.5-2 mm inter se distantibus tertiariis reticulatis areolis 0.8-1 mm latis. Panicula 5-7 X 3-5 cm submultiflora; flores 5-meri, pedicellis 1-1.5 mm longis, bracteolis 0.5-1 X 0.05-0.15 mm ca. 1 mm infra hypanthii basim insertis mox deciduis. Hypanthium (ad torum) 1.1-1.8 X 1.6-1.7 mm; calycis tubus 0.3-0.4 mm altus, lobis interioribus 0.3-0.4 mm altis basim versus remotiusculis apice rotundato, dentibus exterioribus acutis callosis lobos interiores aequantibus. Petala glabra 1-1.3 X 0.9-1.3 mm oblongo-elliptica vel subrotundata apice rotundato et paulo emarginato. Flores femininei: stamina abortiva glabra, filamentis 1.3 mm longis, antherarum thecis oblongis 0.9 X 0.25 mm late biporosis; stylus 2.6 X 0.35 mm glaber in ovarii apice 0.6 mm immersus; stigma capitellatum 0.7 mm diam.; ovarium 3-loculare glabrum 1/2-inferum apice conico glabro 0.6 mm alto. Flores masculini: filamenta 1.8-1.9 mm longa, antherarum thecis 0.8 X 0.4 X 0.5 mm late (0.4 mm) biporosis, connectivis infra loculos 0.3 mm prolongatis incrassatis; ovarium abortivum, stylo incluso 0.5 X 0.15 mm apice truncato non expanso.

Type Collection: J. J. Wurdack 1389A (holotype US 2404293; isotype USM; 7 additional isotypes to be distributed), collected in the jalca zone 1-5 km west of Molinopampa, Prov. Chachapoyas, Depto. Amazonas, Peru, elev. 2400-2450 m, 18 July 1962. "Flowers white. Occasional."

Paratype: Wurdack 1389B, with the same locality data.

Miconia globuliflora has sharply 4-angled branches, rather persistent pedicellar bracteoles 1.5-2 X 0.4-0.8 mm, and anthers with a second septum extending nearly to the thecal apex. While some collections of M. glaberrima (Schlecht.) Naud. closely resemble M. molinopampana, that Central American species has the inflorescence branchlets at each node mostly in fours rather than paired. The immediately available material (Macbride 5771, US) of M. glaberrima var. australis is imperfect, but the pubescence indicates that the Junín (Peru) plants are not conspecific with the frequently collected Central American species (nor with M. molinopampana). Miconia rubens (DC.) Naud. has much smaller petals and anthers; as suggested by Macbride and confirmed by Gleason's notes from Berlin, the Peruvian record of this species is surely based on a misidentification, Weberbauer 4105 having setulose branchlets and petioles as well as barbellate primary vein axils on the lower leaf surfaces. The type collection of M. molinopampana is female, while Wurdack 1389B is male.

Wurdack 1428, also assigned to M. molinopampana, was collected in a sheltered ravine on Cerro Malcabal, above Molinopampa; this collection has larger leaves (to 10 X 4.5 cm) than the extensive type collection from the exposed (but lower elevation) jalca, but similar qualitative vegetative features and identical flowers. The only other sympatric species of the small-flowered group in Sect. Cremanium is M. dumetosa Cogn.; that species is also apparently dioecious, with Wurdack 1433 (Cerro Malcabal, Amazonas) being male while Weberbauer 4389 (BR) is female. A

recent male collection from Carpish, Huánuco (Ferreyra 2376, US, USM) also seems referable to M. dumetosa, although having slightly longer cauline pubescence and thicker petioles. Miconia gleasoniana Wurdack has much the general aspect of M. dumetosa, but shows 4-pored anthers and hermaphroditic flowers. Miconia crassistigma Cogn. (Weberbauer 3407, BR) is certainly specifically distinct from M. dumetosa (although also from Huánuco); only female flowers are currently known and the species should be evaluated in connection with M. galactantha Naud. when more material is collected.

HENRIETTELLA MAGUIREI Wurdack, sp. nov.

H. membranifoliae Cogn. affinis, sed foliis crassioribus supra glabris sclerideis occultis differt.

Ramuli robusti obtuse quadrangulati, sicut petioli et folia subtus primum densiuscule pilis erectis 0.2-0.5 mm longis dense asperis armati tarde glabrati. Petioli 1-1.5 cm longi robusti; lamina 13-18 X 8.5-13 cm rigide coriacea integra late elliptica apice late acuto basi obtusa, breviter (5-7 mm) triplinervata (pare inframarginali debili neglecto) nervis secundariis 6-8 mm inter se distantibus supra impressis subtus prominenter elevatis nervulis supra obscuris subtus elevato-reticulatis, supra glabra. Flores in ramulis infra folia fasciculati plerumque 4-meri; pedicelli ca. 5 X 0.3 mm ebracteolati pilis clavatis 0.05 mm longis appressis modice armati. Hypanthium (ad torum) 1.6 X 1.9-2 mm glabrum; calycis tubus 0.3-0.4 mm altus undulate (0.1-0.3 mm) lobatus lobis remotis. Petala 2 X 2 mm rhomboidea apice late acuto. Stamina isomorphica glabra; filamenta 1.8 mm; antherarum thecae 1.5 X 0.6 X 0.6 mm apice paulo emarginato poro 0.4 mm lato dorsaliter inclinato, connectivo dorsaliter ad basim dente hebeti 0.2 mm longo armato. Stylus 5 X 0.5-0.4 mm glaber in ovarii apice immersus; stigma truncatum 0.45 mm diam.; ovarium 4(?)-loculare 2/3-inferum apice conico 8-sulcato 0.5 mm alto glabro.

Type Collection: Bassett Maguire & Celia K. Maguire 44011 (holotype US 2444809; isotypes COL, NY), collected on steep slopes in scrub forest 30 km west of Cajamarca, Depto. Tolima, Colombia, elev. 3200 m, 18 Aug. 1959. "Stems short. Frequent."

Henriettella membranifolia has membranous leaf blades which are sparsely strigulose above and with obvious linear mesophyll inclusions. Henriettella fascicularis (Sw.) Triana and its 5-merous South American analogue, H. sylvestris Gleason, both have much thinner leaf blades sparsely strigulose above and with mesophyll inclusions, as well as petals 2.5-4 mm long. Crystal inclusions in the leaves of H. maguirei certainly cannot be seen superficially. Some of the material of the type collection may have been distributed under the collection number 44010, which is actually Tibouchina paleacea (Triana) Cogn. Some doubt also exists as to the correctness of the type locality; there is a possibility that the specimens may have been gathered along the Buenaventura-Bogotá highway at lower elevations before reaching Cajamarca; Padre Uribe is attempting to recollect the species.

BOOK REVIEWS

Alma L. Moldenke

"In Gardens of Hawaii", by Marie C. Neal, new and revised edition, xix+924 pp., illustr. Special Bulletin 50, Bishop Museum Press, Honolulu, Hawaii. 1965. $15.00

Ever since the author of this book joined the staff of the Bishop Museum in 1920 she meticulously collected data on the ornamentals, fruits, vegetables, and weeds in local gardens, publishing first in book form "In Honolulu Gardens" in 1928, revising this in 1929, producing under the present title the expanded 1948 edition, and seeing on her deathbed the first copy of the present work which has over a thousand more species described and over a hundred more illustrations. This careful study covers 3,000 species in 1,420 genera and 204 families. Of these, 700 are illustrated.

The plant descriptions make excellent word pictures, rendering recognition and identification easy for both the educated amateur and the professional botanist. Hawaiian lore and native names enrich the text and charm the reader. The scientific names are carefully checked. The photographs are well chosen and are usually from the files of the museum. The line drawings are clear cut and are usually the work of the gifted author herself. The 53-page 3-columned index is replete.

Since so few of the Hawaiian garden plants are native to the islands, the value of the book is enhanced by giving the geographic origin and range of these many introductions from the food plants brought in the long canoes from Tahiti for the original Polynesian settlers to the present day intentional transplants and hidden seeds on G. I. boots.

This book forms a superb culmination to Miss Neal's professional work and will last as a fitting memorial to her life.

The trustees of the Juliette M. Atherton Trust are to be congratulated for their financial support in the printing of this tome.

"Monograph of Cyrtandra (Gesneriaceae) on Oahu, Hawaiian Islands," by Harold St. John, 465 pp., illustr. Museum Bulletin 229, Bishop Museum Press, Honolulu, Hawaii. 1966. $12.00

This is a thorough study by a recognized authority on a genus that forms a conspicuous element in the wet forests of Hawaiian mountains, yet has proven difficult to collect and to preserve.

The monograph covers 126 taxa, representing 118 species, 7 varieties and 1 form. There are, in addition, 2 putative hybrids for Oahu. The genus ranges from the Hawaiian Islands through Malaysia.

This study was initiated in 1935 and 1936 when the author surveyed the types preserved in European and United States herbaria and was terminated recently after years of field study by the author and his students.

There are beautifully clear drawings and photographs of flowering twigs and of herbarium sheets, presenting ample details for all the species. There are excellent geographic distribution maps for almost all the species whose ranges vary so considerably. There is also a new usable key, the first to be published since that of Hillebrand in 1888.

"An Introduction to Plant Biology", by Dale S. Braungart and Ross H. Arnett, second revised edition, xiv + 420 pp., illustr. C. V. Mosby Company, St. Louis, Missouri. 1965. $8.50

It is satisfying to welcome this second edition to the college classroom because it shows considerable improvement over the earlier one. My very first impression was that the many typographical errors of the earlier edition have been cleared away. My next one was that the general organization is more modern and more logical. My other leading impressions were: (1) the terms in the glossary are defined more directly, (2) the section on life cycles — now on lavender paper instead of green -- has been clarified, (3) a better choice has been made in the illustrative material, especially in reference to the biochemistry diagrams, and (4) the bibliography arranged by chapter topics at the end of the text is updated and carefully selected for both quantity and quality.

The most important new feature in the preparation of this edition is the careful comparison of the subject matter by the authors with the Biological Science Curriculum Study texts in their varied blue, green and yellow versions that are known and hopefully increasingly used throughout our country. Practically all of our college entrants have been exposed to a one year biology course usually in their sophomore high school year. This should be -- thanks to all the National Science Foundation's training of biology teachers — a good foundation upon which to erect the college program in botany, zoology or biology. It is hoped that all future science textbook writers and revisers in the coming few years will similarly check their material against these texts and the nationally checked syllabi in the other sciences. These studies have been so carefully explored by scientists and educators from both the secondary and advanced levels of teaching.

"Plant anatomy", by Katherine Esau, second revised edition, xx + 767 pp., illustr. John Wiley & Sons, Inc., New York 16, New York, 1965. $14.50

Since 1953 the first edition of this magnificent work has been available virtually the world over in botanical and university libraries -- in seriously decreasing numbers -- to students and professional workers as a reliable and thorough source book of anatomical information, illustration and description with developmental aspects presented as aids in understanding plant structure and structure range. This work was a pen and ink "crystallization" of years of teaching and researching this topic.

Since last year this second edition has been available. It too is magnificent. It covers the following topics in order: plant body, protoplast, cell wall, meristems and differentiation, apical meristems, vascular cambium, epidermis, parenchyma, collenchyma, sclerenchyma, xylem, phloem, secretory structures, periderm, stem, leaf, root, flower, fruit, and seed. At the end of each chapter there are listed detailed and updated references. The indexes are full and carefully compiled. Many new and excellent illustrations have been added. As in all fields of science much new material has accumulated since the earlier writing and it has been well integrated with concomitantly changing emphases and revision of certain basic concepts and terms, especially in reference to the protoplast, cell wall growth, and the structure-function relationship in apical meristem.

Because enthusiasm about the new discoveries on the molecular level may cause some students and newer workers to ignore the importance of such a fundamentally descriptive work as this, the author wisely cautions "A biologist, regardless of his line of specialization, cannot afford to lose sight of the whole organism if his goal is the understanding of the organic world. Knowledge of the grosser aspects of structure is fundamental for effective teaching and research in the more specialized areas of biology. Moreover, the trend toward a reduction of emphasis on factual information in modern teaching makes a readily accessible depository of the basic information on plant structure doubly important."

The dust jacket on "Plant Anatomy" claims correctly that it "gives the student a spirit of discovery in his study of this active field as well as continuing to provide a well documented reference for plant scientists." Magnificent.

NOTES ON BROMELIACEAE, XXIII

Lyman B. Smith

VRIESEA

Vriesia Lindley, Botanical Register 29: pl. 10. 1843. Name conserved as "Vriesea" in the International Code of Botanical Nomenclature, cf. Taxon 8: 232. 1959. Type: V. psittacina (W. J. Hooker) Lindley (Tillandsia psittacina W. J. Hooker). Not Vriesia Hassk. 1842.

Hexalepis Raf. Fl. Tellur. 4: 24. 1838.

Thecophyllum sensu Mez, Bull. Herb. Boiss. ser. II. 3: 131. 1903, in greater part, not André 1889; cf. Smith & Pittendrigh. Journ. Washington Acad. Sci. 43: 401. 1953.

Vriesea subgenus Alcantarea E. Morren ex Mez in Mart. Fl. Bras. 3, pt. 3: 516. 1894.

Cipuropsis Ule, Verhandl. Bot. Ver. Brandenburg 48: 148. 1907; Smith & Pittendrigh, Journ. Washington Acad. Sci. 43: 404. 1953.

Neovriesia Britton in Britton & Wilson, Sci. Survey Porto Rico 5: 141. 1923.

Alcantarea (E. Morren ex Mez) Harms, Notizblatt 10: 802. 1929.

LEAVES always entire, rosulate; blades predominantly ligulate and inconspicuously lepidote, often banded or mottled. SCAPE usually well developed. INFLORESCENCE simple or compound; spikes usually distichous-flowered, often secund-flowered as well. FLORAL BRACTS conspicuous, enfolding or concealing the bases of the flowers. FLOWERS mostly subsessile or with short thick pedicels. PETALS free or very short-connate, ligulate, bearing two scales each (Mez's report of a single scale each in V. triligulata Mez never verified), firm and erect or soon flaccid and drooping. STAMENS included or exserted. OVARY nearly or quite superior; style elongate. OVULES many, usually caudate. FRUIT capsular. SEEDS fusiform with a long straight basal coma.

Mexico and the West Indies to Peru, Bolivia, Paraguay, and northern Argentina, with the greatest concentration of species in eastern Brazil and the next largest in Costa Rica.

The present synopsis is written as much for the amateur as for the professional botanist and therefore explains some matters that would seem self-evident to the latter. For the same reason, a large number of old species are illustrated to facilitate the identification of those in cultivation.

As indicated in the bibliography above, there has been considerable difficulty in settling on the correct orthography or spelling of the genus as well as much disagreement on its definition and limits. In his original publication of the genus, Lindley dropped the final "e" from the name of the Dutch botanist, Dr. W. de Vriese, and gave it a Latin form by adding "ia" to the

end. Later botanists, beginning with Beer, considered this grammatically incorrect and used de Vriese's full family name plus a final "a". In 1906 in the first list of conserved generic names in the report on the International Botanical Congress of Vienna, Vriesea was chosen in preference to the earlier Hexalepis. This saved us from losing one of the most familiar names in the Bromeliaceae, but caused confusion by using the second spelling with the original publication and giving no reason for the substitution. Each spelling has precedents that can be interpreted in its support or the matter would have been settled long ago, so the question was raised again and the committee on the conservation of generic names gave a ruling in favor of the second spelling, "Vriesea", with a definite clarification of its use. So this nagging irritation is laid to rest and we can proceed to more important matters.

The confusion about the limits of Vriesea is a much more serious matter than its spelling. Lindley and his predecessor, Rafinesque, used the same species, the former Tillandsia psittacina, to typify the new genus, and made the same distinction of appendages on the petals in Vriesea and none in Tillandsia. Because of the lack of good petals in most herbarium material, professional botanists have tried desperately to find some other characters that will correlate with the basic one of petal-appendages. André erected Thecophyllum on the basis of large primary bracts and aborted branches without seeing any petal structure. Mez, also without benefit of petals, reduced it to a section of Guzmania in his first monograph and later discovering free appendaged petals in supposed species of Thecophyllum, restored it to generic status as closely allied to Vriesea. In practice, the character of aborted branches breaks down, and of André's two original species Thecophyllum wittmackii proves to be a Guzmania and T. poortmanii remains unverified. The net result is that most of the species treated as Thecophyllum in Mez's second monograph in the Pflanzenreich and by myself in the North American Flora go into Vriesea, a few into Guzmania, and a very few into Tillandsia.

Another source of confusion lies in the close habital resemblance of certain Andean species of Vriesea with their much commoner neighbors in Tillandsia due to their narrowly triangular leaf-blades or relatively small flowers or both characters together. Mez tried to evade this difficulty by considering their petal-appendages to be a different kind of structure than those of typical Vriesea, that is laterally produced auricles rather than terminally produced scales. I have tried to follow him in this but can no longer convince myself of any real distinction.

Cipuropsis was based on a single species and never reached cultivation, and Neovriesia was an unnecessary name when published, as Hexalepis was already available to Britton when he followed the American Code in search of strict priority. Both cases are technicalities that the amateur can happily ignore.

The attempt to make a separate genus of Alcantarea on the basis of an apical as well as a basal coma on the seed and flaccid petals is more logical than the previous examples, but pending

more evidence, it seems best not to change Mez's system unless a definite improvement can be made. His division of the subgenus Vriesea (as Euvriesea) into two sections, Vriesea (as Genuinae) with exserted stamens and Xiphion with included, also appears logical as the line between the two breaks down in the vicinity of Rio de Janeiro in certain species with compound inflorescences, and thus does not warrant higher rank for the two groups. Incidentally, this merging, as well as the heavy concentration of species of all three parts of the genus, would indicate that the area around Rio de Janeiro is the probable place of origin of Vriesea. Mez's subgenus Conostachys has the floral characters of section Vriesea and merges so gradually that its character of flowers in more than two ranks is not usable except to distinguish species. The subdivisions of Vriesea may be summarized as follows:

1. Seed with the apical appendage minute and undivided; petals firm and remaining more or less erect after anthesis. Subgenus VRIESEA
   2. Stamens exserted; bracts mostly brightly colored with red, orange, or yellow.....Section VRIESEA
   2. Stamens included; bracts mostly dull green or brownish. Section XIPHION
1. Seed with the apical appendage divided into a short coma; petals soon flaccid and drooping.....Subgenus ALCANTAREA

As far as information permits, the text of this paper is ordered in accordance with the above classification, but the position of many species is tentative and is so noted. The key to species is designed primarily as a tool of identification and makes no pretense of being natural. However, by happy coincidence, it frequently brings together large groups of closely related species. Cross references are given to several species of Tillandsia whose ligulate leaf-blades tend to make them confused with Vriesea when they lack petals.

ARTIFICIAL KEY TO SPECIES

1. Flowers in exactly 2 ranks but sometimes twisted until secund.
   2. Flowers not secund except sometimes insofar as the petals are exserted from the bracts on one side.
      3. Leaf-blades narrowly triangular, usually densely lepidote.
         4. Inflorescence compound.....Subkey I
         4. Inflorescence simple.....Subkey II
      3. Leaf-blades ligulate to linear, not tapering evenly from base to apex, usually glabrous or obscurely lepidote.
         5. Inflorescence compound.
            6. Upper scape-bracts equaling or exceeding the internodes. Subkey III
            6. Upper scape-bracts shorter than the internodes...Subkey IV
         5. Inflorescence simple.
            7. Scape straight or ascending; inflorescence erect.

8. Flowers all erect, either imbricate or appressed to the rhachis.....Subkey V
8. Flowers (at least the lowest ones) not imbricate, spreading or divergent with evident space between them. Subkey VI
7. Scape decurved; inflorescence pendulous.....Subkey VII
2. Flowers secund at anthesis and after; floral bracts often secund as well; stamens almost always included.
9. Inflorescence compound.....Subkey VIII
9. Inflorescence simple.....Subkey IX
1. Flowers in more than 2 ranks, polystichous, or so few that their relative position is not evident.
10. Inflorescence compound; stamens included.....Subkey X
10. Inflorescence simple; stamens mostly exserted.....Subkey XI

SUBKEY I

1. Flowers imbricate.
2. Spikes much longer than the primary bracts; sepals not over 25 mm long; leaf-sheaths dark castaneous or ferruginous.
3. Floral bracts convex, ecarinate; sepals 16-25 mm long.
4. Sepals exceeding the floral bracts. Ecuador, Peru. 1. V. hitchcockiana
4. Sepals equaling or shorter than the floral bracts.
5. Spikes subterete, very narrow; floral bracts 27 mm long. Pl. I, fig. 1. Peru.....2. V. rauhii
5. Spikes strongly complanate; floral bracts 35-50 mm long.
6. Floral bracts 35 mm long, nerved. Peru...3. V. cereicola
6. Floral bracts 40-50 mm long, nearly even. Venezuela, Colombia.....4. V. robusta
3. Floral bracts carinate.
7. Sepals 23 mm long; inflorescence pendent. Pl. I, figs. 2-4. Peru.....5. V. olmosana
7. Sepals 8-13 mm long.
8. Spikes straight; inflorescence digitate; petals denticulate.
9. Scape little if any longer than the spikes; petals pale green. Nicaragua to Peru.....64. V. chontalensis
9. Scape much longer than the spikes; petals white. Colombia.....65. V. crenulipetala
8. Spikes nearly all geniculate, spreading abruptly from the long erect sterile base; inflorescence pinnate.
10. Inflorescence tripinnate; spikes flabellate at the ends of the branches. Ecuador.....66. V. appendiculata
10. Inflorescence not more than bipinnate.
11. Floral bracts distinctly and densely lepidote; spikes oblong or linear; petals crenulate or lacerate.
12. Inflorescence lax, 15-20 cm long; spikes many-flowered with bracteate sterile bases. Venezuela to Bolivia. 67. V. heterandra
12. Inflorescence dense, 7 cm long; spikes few-flowered with naked sterile bases. Venezuela...68. V. lacera

11. Floral bracts obscurely lepidote, appearing glabrous; spikes lanceolate; petals nearly or quite entire, lilac or white. Pl. I, fig. 5. Mexico, West Indies, Venezuela, Colombia.....69. V. didistichoides

2. Spikes (at least the lowest) less than twice as long as the primary bracts; sepals 8-48 mm long.

13. Sepals 8-10 mm long. Pl. I, fig. 6. Colombia, Ecuador. 70. V. fragrans

13. Sepals 22-48 mm long.

14. Floral bracts 60 mm long; spikes lanceolate, densely 4-5-flowered. Ecuador.....71. V. drewii

14. Floral bracts 22-40 mm long.

15. Inflorescence erect.

16. Floral bracts nearly all convex and ecarinate, 24 mm long. Pl. I, fig. 7. Colombia, Ecuador. 6. V. cylindrica

16. Floral bracts carinate.

17. Spikes many-flowered, much exserted above the primary bracts; floral bracts 30-40 mm long, diffusely lepidote. Pl. I, fig. 8. Peru.....7. V. harmsiana

17. Spikes few-flowered, almost wholly covered by the primary bracts; floral bracts 23 mm long, densely lepidote. Pl. I, fig. 9. Peru.....8. V. tillandsioides

15. Inflorescence pendulous.

18. Floral bracts much exceeding the sepals, 40 mm long. Ecuador.....9. V. arpocalyx

18. Floral bracts equaling or shorter than the sepals, 22 mm long. Venezuela to Peru.....10. V. tequendamae

1. Flowers lax.

19. Floral bracts much exceeding the sepals, 35 mm long. Colombia.....11. V. pereziana

19. Floral bracts from about equaling to much shorter than the sepals. Brazil.

20. Primary bracts much shorter than the spreading branches of the broad lax inflorescence; floral bracts 18-25 mm long, about equaling the sepals. Pl. I, fig. 10. 12. V. lubbersii

20. Primary bracts much exceeding the short strict branches of the slenderly cylindric inflorescence; floral bracts 8-10 mm long, one-half or one-third as long as the sepals. Pl. I, fig. 11.....72. V. drepanocarpa

SUBKEY II

1. Floral bracts much shorter than the sepals, fleshy-coriaceous, suborbicular; inflorescence lax. Brazil..73. V. goniorachis

1. Floral bracts equaling to much exceeding the sepals; inflorescence dense or subdense.

2. Leaf-blades with brown cross-bands; inflorescence 3-flowered. Costa Rica.....74. V. jimenezii

2. Leaf-blades concolorous; inflorescence few-many-flowered.

3. Leaf-blades green, obscurely lepidote.

4. Floral bracts to 50 mm long, much exceeding the sepals. Venezuela.....75. V. sulcata
4. Floral bracts 25 mm long, about equaling the sepals. Brazil.....13. V. triangularis
3. Leaf-blades cinereous from a complete covering of scales.
5. Rhachis broadly winged and enfolding the bases of the flowers.
6. Inflorescence complanate, 35 mm wide. Ecuador. 14. V. barclayana
6. Inflorescence terete, 7 mm in diameter. Peru. 3. V. cereicola
5. Rhachis not more than angled.
7. Floral bracts convex and ecarinate, 45 mm long; stamens exserted. Ecuador, Peru.....15. V. patula
7. Floral bracts carinate, to 16 mm long; stamens included. Nicaragua to Peru.....64. V. chontalensis

SUBKEY III

1. Flowers all erect and contiguous at anthesis.
2. Floral bracts black, fleshy; sterile bracts of the branches remote. Brazil.....76. V. funebris
2. Floral bracts paler.
3. Sepals exserted above the floral bracts.
4. Lower spikes covered by the primary bracts; sepals 10-16 mm long (cf. Tillandsia cowellii, fusco-guttata).
4. Lower spikes and all others much exceeding the primary bracts; sepals ca. 40 mm long. Brazil.
5. Primary bracts shorter than the elongate sterile bases of the branches; floral bracts obtusely carinate, 35 mm long. Pl. I, fig. 12.....16. V. gravisiana
5. Primary bract equaling the short sterile base of the lateral branch; floral bracts ecarinate, less than 25 mm long.....17. V. sincorana
3. Sepals covered by the floral bracts.
6. Scape very short and hidden by the leaves; spikes linear, 45-60 cm long. British Guiana.....77. V. soderstromii
6. Scape well developed.
7. Leaf-blades marked with dark wavy cross bands or spots.
8. Floral bracts 30 mm long, lustrous (cf. Tillandsia roezlii).
8. Floral bracts 55-60 mm long, subchartaceous and nerved when dry. Pl. I, figs. 13, 14. Trinidad. 78. V. glutinosa
7. Leaf-blades concolorous.
9. Inflorescence tripinnate at least at base.
10. Floral bracts broadly convex toward apex and weakly if at all carinate; sepals 9-40 mm long (cf. Tillandsia boliviana, denudata, excelsa, fendleri, guatemalensis, maxima, platyphylla, rubella, selleana, tovarensis, werckleana).
10. Floral bracts sharply carinate toward apex.

11. Floral bracts to 33 mm long, rapidly decreasing in size upward (cf. Tillandsia stenoura).
11. Floral bracts 17-25 mm long, gradually decreasing in size upward.
12. Posterior sepals carinate (cf. Tillandsia acuminata, duidae, krukoffiana).
12. Posterior and anterior sepals all ecarinate. Colombia.....79. V. elata
9. Inflorescence not more than bipinnate.
13. Floral bracts ecarinate.
14. Inflorescence digitate or subdigitate from a few spikes.
15. Leaf-sheaths densely ferruginous-lepidote, strongly contrasting with the blades; sepals to 15 mm long. Pl. I, fig. 15. Trinidad, Colombia, Peru. 80. V. chrysostachys
15. Leaf-sheaths greenish or purplish, not contrasting much with the blades; sepals 24-40 mm long (cf. Tillandsia fendleri (var.), grandis, lucida).
14. Inflorescence amply pinnate.
16. Sepals 12-17 mm long.
17. Floral bracts prominently nerved, rather thin; sepals 12-15 mm long (cf. Tillandsia rubella, selleana).
17. Floral bracts even, coriaceous; sepals to 17 mm long. Costa Rica.....81. V. camptoclada
16. Sepals 24-40 mm long.
18. Floral bracts obovate, broadly subtruncate, 32 mm long, narrow and exposing most of the alate rhachis. Colombia.....82. V. hodgei
18. Floral bracts elliptic or ovate, broadest at or below the middle (cf. Tillandsia carnosa, denudata, fendleri, grandis, rauhii).
13. Floral bracts sharply carinate toward apex.
19. Primary bracts equaling or exceeding the lower spikes (cf. Tillandsia spp. of West Indies, Mexico, Central America, and Andean South America).
19. Primary bracts much shorter than all of the spikes.
20. Leaf-blades densely and conspicuously cinereous-lepidote at least beneath (cf. Tillandsia arguta, fassettii, fusiformis, kuntzeana, oerstediana - cf. below in "Miscellaneous Notes", superba).
20. Leaf-blades obscurely lepidote to glabrous.
21. Leaf-blades attenuate at apex but otherwise ligulate
22. Spikes reflexed (cf. Tillandsia somnians).
22. Spikes erect or suberect.
23. Floral bracts 40-45 mm long; spikes long-stipitate (cf. Tillandsia deppeana).
23. Floral bracts 20-23 mm long.
24. Floral bracts oblong, nerved (cf. Tillandsia dubia).
24. Floral bracts elliptic, even. Peru.

83. V. subandina
21. Leaf-blades acute or rounded and apiculate.
25. Floral bracts 40-50 mm long (cf. Tillandsia heterophylla, lajensis, sigmoidea).
25. Floral bracts 15-35 mm long.
26. Floral bracts narrow and revealing the alate rhachis at anthesis.
27. Spikes 7 cm long; floral bracts nerved (cf. Tillandsia zamorensis).
27. Spikes to 25 cm long; floral bracts even. Trinidad, northern South America.....84. V. rubra
26. Floral bracts broad, but sometimes inrolled and revealing the rhachis.
28. Floral bracts coriaceous, even (cf. Tillandsia aequatorialis, denudata, pyramidata, reversa, stenoura, superba).
28. Floral bracts thin, nerved.
29. Floral bracts not over 26 mm long (cf. Tillandsia brevilingua, hamaleana, wagneriana).
29. Floral bracts maximally 32-35 mm long. Brazil.
30. Spikes 8-14-flowered with one or no sterile bracts at base; floral bracts sparsely lepidote toward apex, 27-32 mm long. Pl. I, fig. 16.....18. V. schwackeana
30. Spikes 6-8-flowered with 1-5 sterile bracts at base; floral bracts sparsely lepidote throughout, 35 mm long.....19. V. pinottii
1. Flowers (or at least the lowest) lax, more or less spreading.
31. Pedicels slender, 1-2 cm long, exceeding the floral bracts. Costa Rica.....85. V. pedicellata
31. Pedicels stout, usually much less than 1 cm long, always much shorter than the floral bracts.
32. Primary bracts equaling or exceeding the lowest branches.
33. Sepals acute, all ecarinate, maximally 20-30 mm long. Brazil.....86. V. sceptrum
33. Sepals obtuse to subtruncate or retuse, carinate (posterior), maximally 9-20 mm long.
34. Sepals retuse, distinctly lepidote with rather coarse free-margined scales. Venezuela.....87. V. egregia
34. Sepals obtuse or subtruncate, glabrous or with obscure punctiform scales (cf. Tillandsia biflora, ionochroma, stipitata, wangerinii).
32. Primary bracts all shorter than their axillary branches.
35. Inflorescence cylindric, dense to lax.
36. Sepals maximally 33-35 mm long.
37. Floral bracts exceeding the sepals (cf. Tillandsia thyrsigera).
37. Floral bracts shorter than the sepals. Pl. I, fig. 17. Brazil.....20. V. friburgensis
36. Sepals not over 24 mm long.
38. Inflorescence tripinnate; floral bracts nerved.
39. Floral bracts much shorter than the sepals, ecarinate.

Colombia.....88. V. hospitalis

39. Floral bracts about equaling to distinctly exceeding the sepals, carinate.

40. Spikes broadly ovate, subdense. Colombia. 89. V. magdalenae

40. Spikes elongate, very lax (cf. Tillandsia delicatula).

38. Inflorescence not more than bipinnate.

41. Sepals 9-10 mm long; floral bracts strongly nerved (cf. Tillandsia singularis, truncata).

41. Sepals 16-24 mm long; floral bracts faintly nerved to even.

42. Floral bracts about 5 times as long as the internodes, conduplicate, sharply carinate (cf. Tillandsia carrierei).

42. Floral bracts only 2-3 times as long as the internodes, convex, faintly if at all carinate.

43. Sepals 24 mm long, about equaling the oblong-elliptic floral bracts; pedicels to 8 mm long. Costa Rica. 90. V. ranifera

43. Sepals 17 mm long, much exceeding the suborbicular floral bracts; pedicels short. Brazil. 91. V. thyrsoidea

35. Inflorescence broad, lax.

44. Floral bracts 7-17 mm long, ovate to reniform, mostly covering only about half of each sepal.

45. Floral bracts ovate or elliptic, distinctly longer than wide (cf. Tillandsia asplundii, laxissima, pinnata, venusta).

45. Floral bracts suborbicular to reniform. Brazil.

46. Scape decurved; inflorescence pendulous; floral bracts to 15 mm long.....21. V. billbergioides

46. Scape and inflorescence erect.

47. Inflorescence tripinnate with its lower branches divided and recurving; floral bracts 7 mm long. 22. V. leptantha

47. Inflorescence bipinnate; floral bracts 10-17 mm long, sharply carinate. Pl. I, fig. 18. 23. V. rodigasiana

44. Floral bracts 20-50 mm long.

48. Rhachis of the spike slender, about 2 mm in diameter.

49. Floral bracts strongly incurved and carinate.

50. Sepals exceeding the coriaceous floral bracts, 20-30 mm long; lower primary bracts subfoliaceous. Brazil.....86. V. sceptrum

50. Sepals shorter than the floral bracts; primary bracts not at all foliaceous.

51. Flowers sessile (cf. Tillandsia dyeriana, hamaleana).

51. Flowers on stout but distinct pedicels to 5 mm long.

52. Sterile bases of the branches short, naked or with a single bract. Pl. I, fig. 16. Brazil. 18. V. schwackeana

52. Sterile bases of the branches elongate with several

bracts. Brazil.....24. V. brusquensis
49. Floral bracts nearly or quite straight toward apex, often ecarinate.
53. Leaf-blades acuminate.
54. Floral bracts suberect, about 3 times the internodes, exceeding the sepals; sepals 17 mm long, short-connate (cf. Tillandsia maculata).
54. Floral bracts subspreading, 1-2 times the internodes, shorter than the sepals; sepals 26-29 mm long.
55. Scape-bracts apiculate, the upper ones much reduced; stamens equaling or exceeding the petals. Brazil. 25. V. neoglutinosa
55. Scape-bracts acuminate, all large and subfoliaceous; stamens included. Pl. I, fig. 19. Brazil. 92. V. altodaserrae
53. Leaf-blades more or less rounded and apiculate.
56. Sepals acute; leaf-sheaths purple. Brazil.
57. Sterile bases of the branches bracteate. 26. V. muelleri
57. Sterile bases of the branches naked. 93. V. haematina
56. Sepals obtuse; leaf-sheaths pale green throughout or castaneous toward base, sometimes red-spotted.
58. Leaf-blades densely cinereous-lepidote, red-spotted. Pl. I, figs. 20, 21. Brazil.....27. V. saundersii
58. Leaf-blades green, soon glabrous.
59. Floral bracts sharply carinate for most of their length, about 4 times as long as the internodes. Brazil.....94. V. monacorum
59. Floral bracts slightly if at all carinate, mostly much less than 4 times as long as the internodes.
60. Primary bracts exceeding the short bracteate or naked sterile bases of the branches. Pl. I, fig. 17. Brazil, Paraguay, Argentina. 20. V. friburgensis
60. Primary bracts shorter than the long bracteate sterile bases of the branches. Pl. I, fig. 22. Trinidad, Guiana, Brazil.....28. V. procera
48. Rhachis of the spike stout, much more than 2 mm in diameter.
61. Floral bracts very broadly acute to obtuse or truncate, usually ecarinate.
62. Rhachis straight; floral bracts about as long as the internodes (cf. Tillandsia rariflora).
62. Rhachis flexuous to geniculate; floral bracts much longer than the internodes.
63. Rhachis broadly alate with relatively short internodes (cf. Tillandsia platyrhachis).
63. Rhachis scarcely if at all alate.
64. Sepals less than 20 mm long.
65. Floral bracts and sepals strongly nerved; leaf-apex soft (cf. Tillandsia platyphylla).

65. Floral bracts and sepals even; leaf ending with a hard acuminate cusp. Colombia..95. V. killipiana

64. Sepals 30-50 mm long.

66. Floral bracts suborbicular, strongly gibbous.

67. Flowers to 8 cm long; rhachis geniculate. Brazil. 218. V. extensa

67. Flowers to 12.5 cm long; rhachis unknown. Pl. I, fig. 23. Panama, Jamaica (?).....219. V. alta

66. Floral bracts narrower, mostly straight along the apical half.

68. Rhachis geniculate. Pl. I, fig. 24. Brazil. 220. V. geniculata

68. Rhachis merely flexuous.

69. Floral bracts about as long as the internodes, dull. Pl. I, fig. 25. Brazil..96. V. gigantea

69. Floral bracts 2-3 times the internodes, glaucous. Mexico. (cf. Tillandsia viridiflora).

61. Floral bracts acute, carinate; petals flaccid after anthesis. Brazil.

70. Rhachis scarcely if at all geniculate; floral bracts not more than twice as long as the internodes at anthesis. Pl. II, fig. 1.....221. V. regina

70. Rhachis strongly geniculate; floral bracts more than twice as long as the internodes. Pl. II, fig. 2. 222. V. brasiliana

SUBKEY IV

1. Inflorescence subcorymbose, only 45 mm long, its primary bracts involucrate below it; sepals 22 mm long, much exceeding the floral bracts. Brazil.....97. V. paradoxa

1. Inflorescence elongate, much exceeding its primary bracts.

2. Upper scape-bracts imbricate, only the lower ones shorter than the internodes (cf. Tillandsia asplundii, delicatula, laxissima, truncata).

2. Upper scape-bracts shorter than the internodes and usually the others also.

3. Branches of the inflorescence 2-3 cm long. Costa Rica.

4. Sepals 21 mm long; pedicels 6 mm long.....98. V. latissima

4. Sepals 10 mm long; pedicels 11 mm long.....99. V. turbinata

3. Branches of the inflorescence much more than 3 cm long.

5. Scape decurved; inflorescence pendulous; floral bracts suborbicular to broadly ovate, much shorter than the sepals, membranaceous. Brazil.

6. Axis of the inflorescence geniculate; leaf-blades rounded. 21. V. billbergioides

6. Axis of the inflorescence nearly straight; leaves subobtuse.....100. V. languida

5. Scape straight or ascending; inflorescence erect.

7. Primary bracts much exceeding the short sterile naked bases of the branches.

8. Floral bracts about equaling to exceeding the sepals.

9. Inflorescence 3-4-pinnate; sepals 17 mm long (cf. Tillandsia maculata).
9. Inflorescence bipinnate; sepals 24 mm long. Brazil. 101. V. triligulata
8. Floral bracts shorter than the sepals.
10. Inflorescence dense, its branches erect; bracts and sepals castaneous. Brazil.....102. V. maculosa
10. Inflorescence lax, its branches divergent to spreading; bracts and sepals yellow or greenish.
11. Floral bracts elliptic, ecarinate, but little shorter than the sepals (cf. Tillandsia venusta).
11. Floral bracts suborbicular, carinate, about half as long as the sepals. Pl. I, fig. 18. Brazil. 23. V. rodigasiana
7. Primary bracts shorter than the long, usually bracteate, sterile bases of the branches.
12. Sepals 35-50 mm long; floral bracts humped below the apex, strongly rugose on drying. Brazil. 218. V. extensa
12. Sepals not more than 29 mm long.
13. Floral bracts about equaling the internodes or slightly more; branches usually spreading.
14. Leaves acuminate; stamens exserted. Brazil. 25. V. neoglutinosa
14. Leaves broadly acute or rounded and apiculate; stamens included. Pl. I, fig. 22. Trinidad, Guiana, Brazil 28. V. procera
13. Floral bracts much exceeding the internodes; branches erect or ascending. Brazil.
15. Floral bracts sharply carinate; branches subequal. 103. V. stricta
15. Floral bracts ecarinate; the terminal branch much larger and with a longer sterile base than the lateral ones.....104. V. minarum

SUBKEY V

1. Sepals (or the highest or lowest) exceeding the broad floral bracts.
2. Floral bracts coriaceous, even, white-lepidote (cf. Tillandsia excavata).
2. Floral bracts rather thin, nerved, nearly or quite glabrous.
3. Inflorescence many-flowered, to 27 cm long, exceeding the leaves; floral bracts scarcely or not at all carinate. Brazil.....29. V. gradata
3. Inflorescence few-flowered, 6-12 cm long, about equaling the leaves; floral bracts sharply carinate. Brazil. 30. V. modesta
1. Sepals equaling the floral bracts or shorter.
4. Floral bracts carinate so far as visible, pale or brightly colored, green, yellow, or red.
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5. Apical half of the floral bract spreading and not imbricate even before anthesis; keel of the floral bracts straight or concave toward the base, convex toward the apex; inflorescence broadly rounded at apex.

6. Floral bracts acuminate, 60-70 mm. long. Pl. II, fig. 3. Brazil.....31. V. erythrodactylon
6. Floral bracts broadly acute, about 45 mm long. Pl. II, fig. 4. Central America and Colombia to Bolivia and Brazil.....105. V. heliconioides

5. Apical half (as well as the remainder) of the floral bract imbricate until after anthesis; keel of the floral bracts evenly convex; inflorescence usually acute.
7. Floral bracts densely lepidote.
8. Indument of the floral bracts red-brown; floral bracts so crowded as to be nearly horizontal. Pl. II, fig. 5. Brazil, ("Ecuador").....32. V. barilletii
8. Indument of the floral bracts cinereous; floral bracts much less crowded, suberect. Brazil..33. V. vulpinoidea
7. Floral bracts glabrous or very sparsely and obscurely lepidote.
9. Margins of the floral bracts with a strong almost semicircular curve.
10. Inflorescences several in each rosette, lateral; scape-bracts distichous; posterior sepals carinate (cf. Tillandsia multicaulis).
10. Inflorescence single, central; scape-bracts polystichous; sepals ecarinate. Brazil.
11. Floral bracts with obtusely angled margins, bright red with broad yellow margins, 45-60 mm long; inflorescence oblong to linear, 15-40 cm long. Pl. II, fig. 6.....34. V. incurvata
11. Floral bracts with evenly curved margins, 40-50 mm long; inflorescence usually lanceolate or elliptic.
12. Inflorescence very dense; each floral bract more than half covered by the one below it, red with yellow or green margins, its keel slightly curved. Pl. II, fig. 7.....35. V. inflata
12. Inflorescence subdense; each floral bract less than half covered by the one below it, its keel strongly curved.
13. Sepals 38 mm long. Pl. II, fig. 8. 36. V. petropolitana
13. Sepals 27 mm long.....19. V. pinottii
9. Margins of the floral bracts lightly curved.
14. Floral bracts 6-13 cm long, 2-3 times as long as the sepals, wholly green or red.
15. Floral bracts attenuate, straight, 11-13 cm long; posterior sepals carinate (cf. Tillandsia monstrum).
15. Floral bracts acute, incurved, 6-8 cm long; sepals all ecarinate. Pl. II, figs. 9, 10. Tobago, Trinidad, Guiana, Venezuela.....37. V. splendens

14. Floral bracts not over 5 cm long, about twice as long as the carinate sepals at most, mostly bicolorous.
16. Inflorescence subquadrate, almost as broad as long; scape very slender. Pl. II, fig. 11. Brazil.
38. V. carinata
16. Inflorescence much longer than broad; scape stouter.
17. Side of the floral bract about 3 mm wide, 30 mm long, membranaceous, nerved (cf. Tillandsia dubia).
17. Side of the floral bract 10-15 mm wide, 40-50 mm long.
18. Scape elongate, exceeding the leaves; plant flowering 5-8 dm high; floral bracts coriaceous (cf. Tillandsia heterophylla).
18. Scape not exceeding the leaves; plant flowering 2.5-5 dm high.
19. Inflorescence much exceeding the leaves, 16-26 cm long, much more than 3 times as long as broad; floral bracts 45-50 mm long; sepals narrowly elliptic, obtuse or emarginate. Pl. II, fig. 12.
39. V. duvaliana
19. Inflorescence barely or not exceeding the leaves, 11 cm long, much less than 3 times as long as broad; floral bracts 40 mm long; sepals lance-ovate, acute. Pl. II, fig. 13.....40. V. paraibica

4. Floral bracts ecarinate or nearly so.
20. Floral bracts bicolorous, dark castaneous and coriaceous except for the pale soft apex, 3-8 cm long. Brazil.
106. V. longicaulis

20. Floral bracts uniform or nearly so.
21. Floral bracts appearing rugose, at least under a lens.
22. Floral bracts thin or subpapyraceous when dry.
23. Scape-bracts broadly ovate; sepals narrowly elliptic, 24 mm long. Brazil.....41. V. rhodostachys
23. Scape-bracts foliaceous or subfoliaceous; sepals broadly oblong-elliptic, 18 mm long. Guatemala.
107. V. pycnantha
22. Floral bracts thick, rigid, coriaceous.
24. Leaves broadly acute or obtuse, apiculate.
25. Floral bracts barely imbricate. Costa Rica.
108. V. rugosa
25. Floral bracts 3 to 4 times as long as the internodes. Pl. II, fig. 14. Guatemala to Colombia.
109. V. gladioliflora
24. Leaves acute, not apiculate. Costa Rica.
26. Floral bracts broadly acute, much exceeding the sepals.
110. V. pachyspatha
26. Floral bracts obtuse, barely exceeding the sepals.
111. V. macrantha

21. Floral bracts even or longitudinally striate, not rugose.
27. Flowers reflexed at anthesis but the floral bracts often still imbricate. Pl. II, fig. 15. Mexico.
112. V. ovandensis
27. Flowers not reflexed.

28. Floral bracts densely imbricate and concealing the rhachis.
29. Sepals 10-15 mm long; scapes very slender, numerous, lateral (cf. Tillandsia complanata).
29. Sepals 27-40 mm long; scapes rather stout, single, central.
30. Scape-bracts foliaceous; lowest floral bracts long-acuminate. Costa Rica.....113. V. acuminata
30. Scape-bracts bracteiform; none of the floral bracts acuminate (cf. Tillandsia fendleri, glossophylla, walteri).
28. Floral bracts inrolled about the sepals and exposing the rhachis or barely imbricate.
31. Sepals to 8.5 mm long; leaf-blades very narrowly linear, acuminate. Colombia.....114. V. schultesiana
31. Sepals 15-35 mm long; leaf-blades ligulate, acute to subobtuse and apiculate.
32. Sepals 15 mm long; floral bracts 22 mm long; leaves acute. Costa Rica.....115. V. brachyphylla
32. Sepals to 35 mm long; floral bracts 45-55 mm long; leaves broadly acute or subobtuse and apiculate.
33. Floral bracts even; sepals ovate-elliptic, broadly acute. Costa Rica.....116. V. brunei
33. Floral bracts strongly nerved; sepals oblong, rounded Brazil.....42. V. pauciflora

SUBKEY VI

1. Flowers merely divergent at anthesis.
2. Sepals 8.5 mm long; leaf-blades narrowly linear, acuminate. Colombia.....114. V. schultesiana
2. Sepals 16-42 mm long.
3. Scape-bracts all equaling or exceeding the internodes.
4. Sepals 22-28 mm long.
5. Floral bracts exceeding the sepals.
6. Sepals broadly ovate; floral bracts ecarinate. Pl. III, figs. 1, 2. Costa Rica.....117. V. apiculata
6. Sepals 8 mm wide; floral bracts carinate. Brazil. 43. V. biguassuensis
5. Floral bracts shorter than the sepals. Venezuela. 44. V. laxa
4. Sepals 35-40 mm long.
7. Floral bracts shorter than the sepals, ecarinate (cf. Tillandsia viridiflora).
7. Floral bracts about equaling the sepals or longer.
8. Floral bracts rugose, much exceeding the sepals. Costa Rica.....108. V. rugosa
8. Floral bracts faintly nerved, about equaling the sepals. Bolivia, Argentina.....45. V. maxoniana
3. Scape-bracts shorter than the upper internodes; floral bracts much shorter than the sepals. Brazil.
9. Pedicels slender, 8 mm long; sepals subacute, 25-30 mm long

Pl. III, fig. 3.....46. V. amethystina
9. Pedicels very short or none; sepals 16-22 mm long.
10. Leaf-blades lance-triangular, almost the same length as the sheaths, 35 mm wide.....118. V. lancifolia
10. Leaf-blades linear, several times longer than the sheaths 13 mm wide.....119. V. parviflora
1. Flowers spreading to reflexed at anthesis.
11. Floral bracts with truncate bases, usually bright red or yellow, sometimes pale green.
12. Floral bracts from about the same length as the internodes to twice as long, from slightly shorter than the sepals to equaling them; rhachis slender, flexuous, its internodes more or less curved; inflorescence few-flowered. Brazil.
13. Sepals 35-40 mm long; floral bracts about twice as long as the internodes; scape-bracts all imbricate; stamens exserted. Pl. III, fig. 4.....47. V. psittacina
13. Sepals to 25 mm long; floral bracts about equaling the internodes; scape-bracts nearly all shorter than the internodes in this variety with a simple inflorescence; stamens included.....28. V. procera
12. Floral bracts mostly 3 times as long as the internodes or more; rhachis stout, straight or geniculate with straight internodes; inflorescence usually many-flowered.
14. Floral bracts recurved toward the apex and with undulate margins, ample, to 55 mm long, enfolding and exceeding the sepals. Pl. III, fig. 5. Brazil....48. V. recurvata
14. Floral bracts straight or incurved toward apex.
15. Floral bracts sharply carinate, the keel incurved toward the apex, nerved; sepals 20-30 mm long.
16. Rhachis straight or nearly so; flowers sessile (cf. Tillandsia dyeriana).
16. Rhachis more or less geniculate; flowers on short stout pedicels. Pl. III, fig. 6. Brazil..49. V. morreniana
15. Floral bracts slightly if at all carinate, the keel nearly straight; sepals 30-40 mm long. Brazil.
17. Sepals exserted; floral bracts suborbicular, rather thin, only the lowest spreading and not imbricate. 29. V. gradata
17. Sepals included; floral bracts narrower, coriaceous, all spreading with age. Pl. III, fig. 7. 50. V. ensiformis
11. Floral bracts with decurrent auricles at base, usually dull green; stamens included so far as known.
18. Sepals 42-45 mm long.
19. Leaf-blades concolorous; floral bracts about equaling the sepals. Cuba, Puerto Rico, Venezuela. 120. V. macrostachya
19. Leaf-blades marked with spots or lines or both together; floral bracts much shorter than the sepals. Pl. III, figs. 8, 9. Brazil.....121. V. fenestralis
18. Sepals 17-33 mm long.

20. Floral bracts smooth and even when dry, coriaceous, not at all fleshy.
21. Floral bracts dark castaneous with pale margins, from slightly shorter to slightly longer than the sepals. Brazil.....122. V. atra
21. Floral bracts wholly dull green or with dark margins.
22. Sepals very broad, distinctly less than half exserted from the floral bracts if at all; plants robust.
23. Scape-bracts imbricate; leaves concolorous or transversely marked with dark irregular green lines; flowers spreading at anthesis; sepals broadly ovate, acute or subacute. Pl. IV, fig. 1. Trinidad, Brazil 123. V. jonghei
23. Scape-bracts shorter than the upper internodes; leaves transversely marked with purple lines; flowers reflexed at anthesis; sepals broadly elliptic, obtuse. Pl. IV, figs. 2, 3. Brazil.....124. V. fosteriana
22. Sepals narrowly elliptic or suboblong, much longer than broad, about half exserted; flowers usually reflexed at anthesis. Pl. IV, figs. 4, 5. West Indies, eastern South America.....125. V. platynema
20. Floral bracts becoming rugose or nerved when dry, fleshy or subchartaceous or subcoriaceous.
24. Floral bracts fleshy, becoming rugose when dry; rhachis stout.
25. Sepals acute, to 35 mm long; floral bracts obtusely carinate. Brazil.....126. V. wawranea
25. Sepals subobtuse, 25-44 mm long; floral bracts convex, ecarinate.
26. Inflorescence covered with a strongly glutinous material; floral bracts broadly ovate, imbricate before anthesis, usually with dark margins. Pl. IV, fig. 6. Venezuela, Brazil.....127. V. bituminosa
26. Inflorescence dry; floral bracts elliptic, never imbricate, concolorous. Brazil.....128. V. regnellii
24. Floral bracts becoming nerved when dry, subchartaceous or subcoriaceous.
27. Sepals covered by the floral bracts; floral bracts about 4 times as long as the internodes. Pl. II, fig. 15. Mexico.....112. V. ovandensis
27. Sepals exserted for about half their length beyond the floral bracts; floral bracts only about 2 times as long as the internodes.
28. Scape-bracts densely imbricate; pedicels stout; sepals 25-35 mm long. Pl. IV, figs. 4, 5. West Indies, eastern South America.....125. V. platynema
28. Scape-bracts slightly shorter than the upper internodes; pedicels rather slender; sepals to 22 mm long. Brazil.....104. V. minarum

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SUBKEY VII

1. Floral bracts densely verrucose. Costa Rica....129. V. nutans
1. Floral bracts even or nerved but not verrucose.
2. Leaf-blades marked on the upper or both sides with dark spots, broadly rounded; floral bracts farinaceous, 30-40 mm long. Brazil.
3. Floral bracts imbricate and concealing the rhachis, broader than long, equaling the sepals. Pl. IV, figs. 7, 8. 51. V. pardalina
3. Floral bracts enfolding the spreading flowers and thus exposing the rhachis, broadly ovate, equaling or shorter than the sepals. Pl. IV, figs. 9, 10.....52. V. guttata
2. Leaf-blades concolorous, pale green.
4. Floral bracts imbricate and concealing the rhachis, exceeding the sepals.
5. Scapes many, lateral; floral bracts 15-25 mm long (cf. Tillandsia complanata).
5. Scapes single, central; floral bracts 50-55 mm long. Brazil.....53. V. obliqua
4. Floral bracts spreading and exposing the rhachis at anthesis
6. Floral bracts laterally compressed, sharply carinate, incurved, to 40 mm long, slightly shorter than the sepals. Pl. IV, fig. 11. Brazil.....54. V. retroflexa
6. Floral bracts not compressed, slightly if at all carinate, usually much shorter than the sepals; pedicels slender, 8-20 mm long.
7. Floral bracts much more than half as wide as long, 35-45 mm long, their margins much overlapping behind the sepals. Pl. IV, fig. 12. Trinidad, Venezuela, Colombia, Brazil.....55. V. simplex
7. Floral bracts not more than half as wide as long, not over 35 mm long, their margins overlapping little if at all. Pl. IV, figs. 13, 14. Brazil.....56. V. scalaris

SUBKEY VIII

1. Floral bracts black from the first, fleshy; branches of the inflorescence with elongate sterile bases bearing many remote bracts (only very young material known so uncertain if flowers secund). Brazil.....76. V. funebris
1. Floral bracts pale or at most dark castaneous, never black and fleshy.
2. Scape-bracts shorter than the upper internodes (unknown in V. tuerckheimii).
3. Inflorescence dense or subdense; branches erect or suberect; floral bracts mostly more than twice as long as the internodes; sepals 22-24 mm long. Brazil.
4. Leaf-sheaths dark castaneous; scape-bracts half as long as the internodes.....130. V. crassa
4. Leaf-sheaths pale; scape-bracts only a little shorter than the internodes.....131. V. densiflora

3. Inflorescence lax; branches more or less spreading.
5. Floral bracts imbricate; scape unknown (cf. Tillandsia cucullata).
5. Floral bracts less than twice as long as the internodes.
6. Sepals equaling the floral bracts, to 23 mm long. Cuba. 132. V. dissitiflora

6. Sepals exceeding the floral bracts.
7. Pedicels 1-2 cm long, exceeding the floral bracts, very slender; sepals 7-11 mm long. Costa Rica. 85. V. pedicellata

7. Pedicels shorter and stouter, much exceeded by the floral bracts.
8. Branches 20-flowered, to 55 cm long; sepals 15-20 mm long. Pl. IV, figs. 15-17. Hispaniola. 133. V. tuerckheimii

8. Branches 2-3-flowered, to 18 cm long with the sterile part much the longer.
9. Sterile bases of the branches bracteate; sepals 15 mm long. Brazil.....134. V. sparsiflora
9. Sterile bases of the branches naked; sepals 9 mm long. Costa Rica.....135. V. triflora

2. Scape-bracts all imbricate (unknown in V. tuerckheimii).
10. Branches laxly flowered; floral bracts distinctly less than twice as long as the internodes.
11. Pedicels 1-2 cm long, equaling or exceeding the floral bracts. Costa Rica.
12. Floral bracts thick, coriaceous; pedicels stout, 1 cm long.....136. V. discolor
12. Floral bracts membranaceous; pedicels very slender, 1-2 cm long.....85. V. pedicellata

11. Pedicels shorter, always exceeded by the floral bracts.
13. Branches very slender, at most barely exceeding 2 mm in diameter; floral bracts mostly thin.
14. Leaf-blades narrowly triangular, 15 mm wide. Brazil. 12. V. lubbersii

14. Leaf-blades ligulate or linear.
15. Sterile bases of the branches much longer than the few-flowered fertile part; sepals narrowly oblong, obtuse. Jamaica.....137. V. swartzii
15. Sterile bases of the branches much shorter than the fertile part. Brazil.
16. Inflorescence few-branched; plant 35 cm high; sepals 23 mm long, about equaling the floral bracts. 57. V. delicatula

16. Inflorescence much branched; plant 6-30 dm high.
17. Sepals 13 mm long; branches 8-12 cm long; inflorescence narrow.....22. V. leptantha
17. Sepals to 25 mm long; branches to 50 cm long, inflorescence ample.
18. Upper scape-bracts and lower primary bracts foliaceous; floral bracts broadly ovate, acute, much shorter than the sepals.

19. Leaf-blades 5-8 cm wide; plant lacking rhizomes. Pl. IV, fig. 18.....58. V. philippocoburgii
19. Leaf-blades 2-4 cm wide; plant bearing elongate rhizomes.....59. V. vagans
18. Upper scape-bracts and lower primary bracts lanceolate; floral bracts broadly elliptic, broadly acute or obtuse, slightly shorter than or equaling the sepals.....28. V. procera
13. Branches stout, much more than 2 mm in diameter; floral bracts mostly coriaceous.
20. Floral bracts much shorter than the sepals.
21. Primary bracts exceeding the sterile bases of the branches; floral bracts 25-30 mm long. Jamaica. 223. V. gibba
21. Primary bracts much shorter than the sterile bases of the branches.
22. Floral bracts 20-25 mm long; sepals narrowly obovate, to 24 mm long (cf. Tillandsia mima).
22. Floral bracts 7-15 mm long; sepals elliptic, 15-20 mm long. Pl. IV, figs. 15-17. Hispaniola. 133. V. tuerckheimii
20. Floral bracts about equaling or exceeding the sepals.
23. Rhachis verrucose just below each node; floral bracts broadly ovate, acuminate. Pl. IV, fig. 19. Costa Rica to Colombia, West Indies.....138. V. ringens
23. Rhachis not at all verrucose.
24. Sepals acute. Brazil.
25. Primary bracts with distinct elongate blades; inflorescence much branched.
26. Floral bracts ovate, loosely and incompletely sheathing the base of the flower, becoming slightly if at all secund, sulcate when dry with a broad thin margin; sepals oblong, to 37 mm long, about 3 times as long as broad. Pl. I, fig. 25. 96. V. gigantea
26. Floral bracts suborbicular, tightly and completely sheathing the base of the flower, becoming secund, even; sepals lance-ovate, 30 mm long, about twice as long as broad.....139. V. morrenii
25. Primary bracts bladeless, inconspicuous; inflorescence few-branched; sepals 26 mm long. 140. V. ruschii
24. Sepals obtuse.
27. Floral bracts 32 mm long, about twice as long as the internodes; sepals elliptic. Brazil. 141. V. hoehneana
27. Floral bracts 25 mm long, about equaling the internodes; sepals broadly elliptic. Trinidad, Guiana, Amazonian Brazil.....142. V. amazonica
10. Branches densely flowered; floral bracts twice as long as the internodes or longer.

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28. Floral bracts drying dark castaneous except for the apex or the margins. Brazil.
29. Sepals acute; floral bracts broadly ovate, acute, pale and slightly rugulose near the apex, 3-8 cm long, usually much exceeding the sepals...106. V. longicaulis
29. Sepals obtuse; floral bracts suborbicular with narrow pale margins, 2-3 cm long, usually shorter than the sepals. Pl. V, fig. 1.....143. V. itatiaiae
28. Floral bracts usually green or yellow, sometimes red or pale brown, but always pale on drying.
30. Floral bracts equaling or exceeding the sepals of at least the lowest flowers.
31. Sepals twice as long as wide or narrower; floral bracts narrowly obtuse to acuminate.
32. Rhachis verrucose below each node; floral bracts acuminate. Pl. IV, fig. 19. Costa Rica to Colombia, West Indies.....138. V. ringens
32. Rhachis not at all verrucose; floral bracts acute or narrowly obtuse.
33. Floral bracts conduplicate, sharply carinate. Brazil. 24. V. brusquensis
33. Floral bracts broadly convex, weakly or not at all carinate (cf. Tillandsia cucullata, secunda).
31. Sepals but slightly longer than wide; floral bracts obtuse, dull.
34. Floral bracts convex, ecarinate, 22-30 mm long.
35. Spikes many with naked sterile bases. Costa Rica. 81. V. camptoclada
35. Spikes few with long many-bracted sterile bases. Pl. V, figs. 2, 3. Colombia.....144. V. confusa
34. Floral bracts carinate toward apex, 35-45 mm long. Salvador.....145. V. cornus-cervi
30. Floral bracts always distinctly shorter than the sepals.
36. Flowers upwardly secund; branches spreading, many; sepals 35-40 mm long; petals flaccid. Brazil.
37. Rhachis strongly geniculate; only a few flowers secund. Pl. II, fig. 2.....222. V. brasiliana
37. Rhachis merely flexuous, all of the flowers secund. Pl. V, figs. 4, 5.....224. V. imperialis
36. Flowers downwardly secund.
38. Leaves ornamented with dark purple irregular transverse bands; floral bracts broadly ovate, carinate; sepals narrowly elliptic, 25 mm long, much exserted. Pl. V, figs. 6, 7. Brazil.....146. V. hieroglyphica
38. Leaves without purple bands but sometimes with narrow dark green lines.
39. Sepals 20 mm long; branches 4-8-flowered, short, very slender. Brazil.
40. Floral bracts nearly equaling the sepals; branches with naked sterile bases. 147. V. penduliflora
40. Floral bracts only about half as long as the sepals;

branches with bracteate sterile bases.
148. V. segadas-viannae
39. Sepals much more than 20 mm long or the branches many-flowered and stout.
41. Leaf-blades and lower scape-bracts acuminate or acute with a stiff involute-subulate terminal cusp.
42. Sepals about equaling the 3 cm long floral bracts. Costa Rica.
43. Floral bracts obtusely carinate, more or less secund with the flowers. Pl. V, fig. 8. Mexico, Guatemala also.....149. V. werckleana
43. Floral bracts ecarinate, not at all secund.
150. V. kupperiana
42. Sepals distinctly exceeding the floral bracts.
44. Floral bracts abruptly acute, the keel evenly curved from base to apex. Pl. V, fig. 9. Costa Rica to Colombia, Greater Antilles.
151. V. sanguinolenta
44. Floral bracts truncate, gibbous about one-third below the apex. Jamaica.....223. V. gibba
41. Leaf-blades and lower scape-bracts broadly acute or subrounded with a flat soft apiculus. Brazil.
45. Inflorescence few-branched, the terminal branch with an elongate sterile base almost completely covered with bracts.
46. Sepals to 35 mm long; floral bracts barely twice as long as the internodes; plant generally 2 m or taller.....141. V. hoehneana
46. Sepals 17-27 mm long; floral bracts from barely imbricate to 3.5 times the internodes; plant 6-12 dm tall.
47. Leaf-blades glabrous above; floral bracts to 35 mm long, 2.5-3.5 times the internodes.
152. V. longiscapa
47. Leaf-blades covered on both sides with appressed cretaceous brown-centered scales; floral bracts 10 mm long, scarcely more than twice the internodes.....153. V. cearensis
45. Inflorescence many-branched, the terminal branch not much different from the others.
48. Floral bracts 3 to 4 times as long as the internodes, remaining imbricate, obtusely carinate; leaf-blades concolorous.....154. V. hydrophora
48. Floral bracts scarcely more than twice as long as the internodes, faintly or not at all carinate; leaf-blades marked with dark green cross-lines.
155. V. pastuchoffiana

SUBKEY IX

1. Floral bracts acuminate, sharply carinate toward apex; rhachis verrucose below each node. Pl. IV, fig. 19. Costa Rica to

Colombia, West Indies.....138. V. ringens

1. Floral bracts acute or obtuse or if rarely the lowest acuminate then the rhachis not verrucose.
2. Inflorescence dense, the floral bracts at least twice as long as the internodes.
3. Scape-bracts shorter than the internodes.
4. Floral bracts acute, green; leaves acuminate. Guatemala. 156. V. pectinata
4. Floral bracts obtuse, castaneous; leaves broadly rounded or subtruncate. Brazil.....157. V. clausseniana
3. Scape-bracts all exceeding the internodes.
5. Floral bracts rugulose or verrucose throughout when dry.
6. Floral bracts abruptly contracted to a distinct triangular apex; sepals acute. Panama.....158. V. woodsoniana
6. Floral bracts without abrupt distinction between base and apex.
7. Leaf-blades broadly acute or rounded and apiculate.
8. Floral bracts becoming secund with the flowers; sepals twice as long as broad. British Guiana. 159. V. pachychlamys
8. Floral bracts remaining erect; sepals less than twice as long as broad. Pl. II, fig. 14. Guatemala to Colombia.....109. V. gladioliflora
7. Leaf-blades acuminate; floral bracts slightly more than twice as long as the internodes.
9. Leaf-blades concolorous, green and obscurely lepidote on both sides; sepals 40 mm long; floral bracts rugulose, thick, coriaceous. Costa Rica.....160. V. tonduziana
9. Leaf-blades pale and densely appressed-lepidote beneath; sepals not over 25 mm long; floral bracts rather thin, verrucose. Pl. V, figs. 10, 11. Mexico. 161. V. vanhyningii
5. Floral bracts even or nerved but neither rugulose nor verrucose except sometimes near their apices.
10. Floral bracts bicolorous, dark castaneous and coriaceous except for the pale soft apex, 3-8 cm long. Brazil. 106. V. longicaulis
10. Floral bracts uniform or nearly so.
11. Floral bracts remaining erect, not becoming secund with the flowers.
12. Floral bracts ecarinate.
13. Floral bracts green, about twice as long as the internodes. Brazil.....162. V. unilateralis
13. Floral bracts castaneous when dry, densely imbricate. Costa Rica.
14. Leaf-blades acuminate, concolorous, subglabrous. 114. V. acuminata
14. Leaf-blades subrounded and apiculate, densely white-lepidote beneath, subglabrous above. 163. V. bicolor
12. Floral bracts carinate at least toward the apex.
.....

15. Leaf-blades acuminate; floral bracts up to 5 cm long, much exceeding the sepals. Lesser Antilles.
164. V. guadelupensis

15. Leaf-blades rounded and apiculate. Brazil.
16. Floral bracts greenish brown, obtusely carinate.
152. V. longiscapa

16. Floral bracts bright red except for the green apex and margins, sharply carinate.
60. V. interrogatoria

11. Floral bracts becoming secund with the flowers.
17. Rhachis subalate, up to 10 mm in diameter, dark, its internodes narrowly obconical; leaves mostly red-spotted; plant 1-2 m high. Pl. V, fig. 9. Costa Rica to Colombia, Greater Antilles.
151. V. sanguinolenta

17. Rhachis terete or angled with its internodes subcylindrical, rarely more than 5 mm in diameter.
18. Leaf-blades less than 2 cm wide, acuminate; plants not over 5 dm high; inflorescence few-flowered. Costa Rica, Panama.....165. V. subsecunda

18. Leaf-blades 3-10 cm wide; plants 5-20 dm high; inflorescence usually many-flowered.
19. Floral bracts strikingly colored with contrasting margins.
20. Floral bracts bright red with green apex and margins Brazil.....60. V. interrogatoria

20. Floral bracts drying dark castaneous with a narrow pale margin, even, lustrous, broadly convex.
21. Leaf-blades very obscurely punctulate-lepidote beneath; floral bracts broadly ovate. Costa Rica.
166. V. pittieri

21. Leaf-blades covered beneath with white scales; floral bracts broader than long. Costa Rica.
167. V. ampla

19. Floral bracts green, dull buff, or pale brown.
22. Floral bracts evenly convex without any keel.
23. Sepals 15-20 mm long; leaf-blades 2.5-4 cm wide.
24. Leaf-blades concolorous; floral bracts equaling the sepals. Pl. V, fig. 12. Central America, British Guiana, Venezuela, Colombia.
168. V. viridiflora

24. Leaf-blades marked with fine longitudinal red stripes; floral bracts much exceeded by the sepals. Pl. V, fig. 13. Costa Rica.
169. V. marnier-lapostollei

23. Sepals 35 mm long; leaf-blades 6 cm wide. Cuba.
170. V. haplostachya

22. Floral bracts carinate.
25. Leaf-blades acuminate. Mexico...171. V. chiapensis

25. Leaf-blades broadly acute or rounded and apiculate.
26. Sepals up to 34 mm long; floral bracts barely twice as long as the internodes; plant usually

2 m or higher. Brazil.....141. V. hoehneana

26. Sepals 20-27 mm long; floral bracts two and a half to three times as long as the internodes; plant 6-12 dm high. Brazil.....152. V. longiscapa

2. Inflorescence lax, the floral bracts distinctly less than twice as long as the internodes.

27. Leaf-blades linear, 4 dm long and not over 5 mm wide; inflorescence typically 3-flowered; floral bracts membranaceous. Costa Rica.....172. V. graminifolia

27. Leaf-blades narrowly triangular or ligulate, 15-80 mm wide; inflorescence normally much more than 3-flowered; floral bracts firmer.

28. Scape-bracts, or at least the upper ones, shorter than the internodes; sepals much exceeding the floral bracts.

29. Leaf-blades narrowly triangular, acuminate; floral bracts obtuse, ecarinate.

30. Floral bracts and sepals thick, coriaceous. Brazil. 173. V. brassicoides

30. Floral bracts and sepals thin, chartaceous. Venezuela.....174. V. fibrosa

29. Leaf-blades ligulate, acute or broadly rounded and apiculate; floral bracts acute.

31. Floral bracts ecarinate; sepals suboblong, to 40 mm long. Colombia.....175. V. socialis

31. Floral bracts carinate; sepals elliptic, 25-28 mm long. Brazil.....176. V. platzmannii

28. Scape-bracts all imbricate.

32. Floral bracts exceeding the sepals.

33. Rhachis verrucose below each node; floral bracts rugulose; leaf-blades concolorous, green, 20 mm wide. Colombia.....177. V. verrucosa

33. Rhachis not verrucose; floral bracts even; leaf-blades banded or spotted, 30-35 mm wide.

34. Floral bracts acute or acuminate; sepals 17 mm long. British Honduras.....178. V. schippii

34. Floral bracts obtuse; sepals 26 mm long. Costa Rica. 179. V. macrochlamys

32. Floral bracts distinctly exceeded by the sepals.

35. Leaf-blades narrowly triangular, long-acuminate, not over 3 cm wide.

36. Floral bracts fleshy-coriaceous, coarsely lepidote except in age; flowers divergent; sepals oblong, 27-30 mm long. Brazil.....180. V. oligantha

36. Floral bracts subchartaceous, sparsely and minutely lepidote; flowers spreading; sepals broadly elliptic, 18 mm long. Pl. V, figs. 14, 15. Trinidad. 181. V. broadwayi

35. Leaf-blades ligulate, acute or rounded and apiculate or sometimes the apex acuminate for a short distance, 15-80 mm wide.

37. Plants less than 1 m high; scape slender; floral bracts ecarinate.

38. Floral bracts little more than once as long as the internodes; leaf-blades densely maroon-spotted. Pl. V, figs. 16, 17. Brazil.....182. V. racinae
38. Floral bracts nearly twice as long as the internodes; leaf-blades concolorous.
39. Leaf-blades broadly rounded and apiculate; floral bracts remaining erect or nearly so. Brazil. 162. V. unilateralis
39. Leaf-blades acuminate; floral bracts becoming secund with the flowers. Colombia.....183. V. vexillata
37. Plants 1-2 m high or more; scape stout; floral bracts obtusely carinate toward apex.
40. Sepals narrowly elliptic; floral bracts about twice as long as the internodes. Brazil....141. V. hoehneana
40. Sepals very broadly elliptic; floral bracts about as long as the internodes. Trinidad, Guiana, Brazil. 142. V. amazonica

SUBKEY X

1. Branches of the inflorescence well developed, at least below the flowers.
2. Flowers subsessile (pedicels at most 4 mm long and very stout).
3. Rhachis well developed, the flowers racemose.
4. Primary bracts covering the branches (cf. Tillandsia biflora, stipitata).
4. Primary bracts much shorter than the branches, or if longer than the lowest ones (V. splitgerberi) then narrow and spreading and not covering them.
5. Flowers erect, densely imbricate, numerous. Pl. V, figs. 18, 19. Costa Rica, Trinidad, Guiana, Venezuela, Colombia.....184. V. splitgerberi
5. Flowers divergent to spreading, lax.
6. Floral bracts 30 mm long, exceeding the sepals. Brazil. 61. V. corcovadensis
6. Floral bracts 4 mm long, much shorter than the sepals. Costa Rica.....185. V. diffusa
3. Rhachis aborted, the flowers corymbose.
7. Branches short, the lower ones 10-15-flowered. Pl. V, fig. 20. West Indies, Venezuela, Colombia, Ecuador. 186. V. capituligera
7. Branches elongate, the lower ones 2-flowered. Costa Rica. 187. V. crassiflora
2. Flowers distinctly pedicellate. Costa Rica.
8. Pedicels 11 mm long.....99. V. turbinata
8. Pedicels 5-6 mm long.
9. Pedicels slender.
10. Sepals symmetrical, narrowly obovate, broadly rounded, 14 mm long.....188. V. cylindracea
10. Sepals strongly asymmetric, slightly emarginate, 10 mm long (undeveloped).....189. V. leptopoda

9. Pedicels very stout; leaves green tinged with violet beneath.....98. V. latissima

1. Branches of the inflorescence very short or aborted with the flowers fascicled in the axils of the primary bracts, or else the perfect flowers solitary on each branch (the genus Thecophyllum as used largely by Mez).

11. Flowers 3 or more in the axil of at least each lower primary bract.

12. Floral bracts exceeding the sepals; leaves concolorous. Costa Rica.....190. V. bracteosa

12. Floral bracts much shorter than the sepals; leaves cross-barred.

13. Primary bracts large, imbricate; floral bracts broadly reniform. Costa Rica.....191. V. nephrolepis

13. Primary bracts small, remote; floral bracts suborbicular. Guatemala, Honduras.....192. V. montana

11. Flowers 1 or 2 in the axil of each primary bract.

14. Perfect flowers 2 in the axil of each primary bract.

15. Pedicels slender, 1-2 cm long. Costa Rica. 193. V. violascens

15. Pedicels stout and short or lacking.

16. Floral bracts exceeding the sepals.

17. Blades of the leaves and scape-bracts covered with pale appressed scales. Costa Rica.

18. Inflorescence cylindric, fertile throughout.

19. Leaf-blades narrowly triangular, attenuate, 25 mm wide; primary bracts spreading...194. V. leucophylla

19. Leaf-blades ligulate, abruptly acute, 35 mm wide; primary bracts erect.....195. V. spectabilis

18. Inflorescence cyathiform with a coma of sterile bracts at apex.....196. V. comata

17. Blades of the leaves and scape-bracts glabrous or subglabrous.

20. Sepals 7-8 mm long.

21. Primary bracts erect; leaf-blades acute, 30-40 mm wide. Lesser Antilles.....197. V. antillana

21. Primary bracts decurved toward apex; leaf-blades acuminate, 25 mm wide. Trinidad, Venezuela (Isla Margarita).....198. V. johnstonii

20. Sepals 10-15 mm long.

22. Leaf-blades marked throughout with fine irregular cross-bands; inflorescence densely capitate or short-cylindric. Costa Rica.....199. V. notata

22. Leaf-blades concolorous or slightly marked at base.

23. Leaf-blades ligulate, acute to rounded and apiculate; inflorescence dense; sepals 15-17 mm long.

24. Sepals suborbicular. Costa Rica...190. V. bracteosa

24. Sepals elliptic. Colombia.....200. V. hygrometrica

23. Leaf-blades acuminate; inflorescence lax at least toward base. Ecuador.....201. V. paupera

16. Floral bracts shorter than the sepals.

25. Leaves with fine wavy cross-lines.

26. Floral bracts ovate, acute; primary bracts suberect; leaf-blades acuminate, 40 mm wide; sepals 16 mm long. Costa Rica.....202. V. picta
26. Floral bracts suborbicular to reniform, rounded or truncate; primary bracts spreading to reflexed.
27. Leaf-blades acuminate, 20 mm wide; sepals 8 mm long, slightly asymmetric. Costa Rica.....203. V. lineata
27. Leaf-blades acute, 30-70 mm wide; sepals 11-20 mm long
28. Scape erect; sepals broadly elliptic, 12-20 mm long.
29. Inflorescence few-flowered, subdense, 5 cm long; sepals 12-15 mm long. Guatemala, Honduras. 192. V. montana
29. Inflorescence many-flowered, slenderly cylindric, 15-30 cm long; sepals 20 mm long. Costa Rica. 204. V. irazuensis
28. Scape decurved; sepals broadly obovate, 20 mm long. Costa Rica.....205. V. ororiensis
25. Leaves unmarked or sometimes with straight longitudinal stripes.
30. Inflorescence capitate or short-cylindric, not over 5 cm long. Costa Rica.
31. Pedicels 8 mm long, stout; leaf-blades 4-5 cm wide. 206. V. capitata
31. Pedicels lacking; leaf-blades 6-15 mm wide.
32. Floral bracts broadly elliptic, to 12 mm long. 207. V. attenuata
32. Floral bracts squamiform, 2.5 mm long. 208. V. stenophylla
30. Inflorescence cylindric, 7-27 cm long.
33. Leaf-blades and scape-bracts acuminate, pale-lepidote; primary bracts reflexed. Costa Rica.
34. Sepals 9 mm long, orbicular.....209. V. balanophora
34. Sepals 11-17 mm long, suborbicular or obovate.
35. Inflorescence many-flowered, dense, 22-27 cm long; floral bracts 8 mm long; sepals 17 mm long. 210. V. viridis
35. Inflorescence few-flowered, very lax, 7 cm long; floral bracts 16 mm long; sepals 20 mm long. 211. V. hainesiorum
33. Leaf-blades (unknown in V. spectabilis) and scape-bracts acute or rounded and apiculate.
36. Primary and scape-bracts marked with fine purple longitudinal stripes like the leaves. Costa Rica. 212. V. williamsii
36. Primary and scape-bracts unmarked.
37. Primary bracts erect or nearly so, not recurving toward apex. Costa Rica.....195. V. spectabilis
37. Primary bracts spreading to recurved, at least toward apex.
38. Primary bracts densely pale-lepidote. Costa Rica.
39. Floral bracts acute, 12 mm long. 213. V. standleyi

39. Floral bracts rounded, 3-8 mm long.
188. V. cylindracea

38. Primary bracts glabrous and even or verrucose.
40. Inflorescence erect; sepals obovate or narrowly elliptic, twice as long as wide. Puerto Rico.
214. V. sintenisii

40. Inflorescence pendulous; sepals very broadly obovate. Costa Rica.....205. V. ororiensis

14. Perfect flowers single in the axil of each primary bract, but the presence of a floral bract indicating a compound inflorescence. Costa Rica
41. Flowers (branches) secund.....215. V. singuliflora
41. Flowers (branches) remaining polystichous..216. V. vittata

SUBKEY XI

1. Inflorescence polystichous-flowered only at base, lax, elongate. Cuba (variety).....125. V. platynema
1. Inflorescence wholly polystichous-flowered.
2. Leaf-blades ligulate, acute, 4-5 cm wide. Pl. VI, figs. 1, 2. Mexico.....217. V. malzinei
2. Leaf-blades narrowly triangular, acuminate. Brazil.
3. Scape-bracts all bearing recurved elongate blades; inflorescence dense, few-flowered, 4-9 cm long....62. V. poenulata
3. Scape-bracts bearing erect blades, those of the upper ones very short.
4. Inflorescence dense except at base; flowers in about 4 ranks, mostly suberect; floral bracts inflated. Pl. VI, figs. 3, 4.....63. V. flammea
4. Inflorescence lax; flowers in slightly more than 2 ranks, all divergent or spreading at anthesis; floral bracts closely enfolding the sepals.....61. V. corcovadensis

Subgenus VRIESEA
Section VRIESEA

1. V. HITCHCOCKIANA (L. B. Smith) L. B. Smith, Contr. U. S. Nat. Herb. 29:446. 1951. Tillandsia hitchcockiana L. B. Smith, Contr. Gray Herb. 89:10, pl. 4, figs. 2-5. 1930. Ecuador, Peru.

2. V. RAUHII L. B. Smith, Phytologia 6:194, pl. 1, figs. 5, 6. 1958. Stamens probably exserted. Pl. I, fig. 1: Spike x 1/4. Peru.

3. V. CEREICOLA (Mez) L. B. Smith, Phytologia 6:194. 1958; 8: 504. 1963. Tillandsia cereicola Mez, Fedde Rep. Nov. Spec. 3:34. 1906. Vriesea lopezii L. B. Smith, PHytologia 4:218, pl. 2, figs. 8-10. 1953. Peru.

4. V. ROBUSTA (Griseb.) L. B. Smith, Phytologia 7:4. 1959. Tillandsia robusta Griseb. Nachr. Ges. Wiss. Goett. 1864:15. 1865. Vriesea chlorantha L. B. Smith, Phytologia 5:286, pl. 2, figs. 9-12. 1955. Stamens (immature ?) about equaling the petals. Venezuela, Colombia.

5. V. OLMOSANA L. B. Smith, sp. nov. A V. cereicola (Mez) L. B. Smith, cui valde affinis, bracteis florigeris carinatis differt.

PLANT stemless, flowering to 6 dm long with the inflorescence extended. LEAVES numerous, 5-6 dm long, completely covered with fine appressed cinereous scales; sheaths suborbicular, scarcely distinct from the blades, 45 mm wide, ferruginous; blades very narrowly triangular, 35 mm wide at base. SCAPE decurved, slender, glabrous; scape-bracts densely imbricate and completely covering the scape, subfoliaceous with long linear blades. INFLORESCENCE densely bipinnate, 37 cm long; primary bracts broadly ovate, barely exceeding the sterile bracteate bases of the branches, subdensely and obscurely lepidote; spikes erect or suberect, the lateral to 14 cm long, the terminal to 18 cm including the sterile base, linear-lanceolate, acute, strongly complanate, 10-12-flowered, dense, glabrous; rhachis alate; floral bracts lanceolate, acute, carinate, 25 mm long, about equaling the sepals, subcoriaceous, nerved and reddish toward apex, yellowish green below; pedicels obscure. SEPALS free, lanceolate, broadly acute and apiculate, 23 mm long, ecarinate, subcoriaceous; petals linear, 35 mm long, bearing 2 large linear-lanceolate acute scales at base, the blades deep blue-violet with a narrow white margin; stamens exserted. Pl. I, fig. 2: Leaf x 1/4; fig. 3: Spike x 1/4; fig. 4: Sepal x 1.

PERU: Lambayeque or Cajamarca (?): Valley of Olmos, alt. 1000 m, 1956, flowered in Heidelburg in 1964, W. Rauh P-333 (US, type)

6. V. CYLINDRICA L. B. Smith, Contr. U. S. Nat. Herb. 29:445, fig. 46. 1951. Pl. I, fig. 7: Spike x 1/4. Colombia, Ecuador.

7. V. HARMSIANA (L. B. Smith) L. B. Smith, Contr. U. S. Nat. Herb. 29:447. 1951. Tillandsia harmsiana L. B. Smith, Contr. Gray Herb. 98:16, pl. 4, figs. 12-15. 1932. Pl. I, fig. 8: Spike x 1/4. Peru.

8. V. TILLANDSIOIDES L. B. Smith, Phytologia 9:256, pl. 4, figs. 6, 7. 1963. Pl. I, fig. 9: Spike x 1/4. Peru.

9. V. ARPOCALYX (André) L. B. Smith, Contr. U. S. Nat. Herb. 29:445. 1951. Tillandsia arpocalyx André, Énum. Bromél. 7. Dec. 13, 1888; Rev. Hort. 60:567. Dec. 16, 1888. Ecuador.

10. V. TEQUENDAMAE (André) L. B. Smith, Contr. U. S. Nat. Herb. 29:444. 1951. Tillandsia tequendamae André, Énum. Bromél. 8. Dec. 13, 1888; Rev. Hort. 60:568. Dec. 16, 1888. Venezuela to Peru.

11. V. PEREZIANA (André) L. B. Smith, Contr. U. S. Nat. Herb. 29:444. 1951. Tillandsia pereziana André, Énum. Bromél. 7. Dec. 13, 1888; Rev. Hort. 60:567. Dec. 16, 1888. Colombia.

12. V. LUBBERSII (Baker) E. Morr. ex Mez in Mart. Fl. Bras. 3, pt. 3:533, pl. 99. 1894. Tillandsia lubbersii Baker, Handb. Bromel. 219. 1889. Pl. I, fig. 10: Spike x 1/4. Brazil.

13. V. TRIANGULARIS Reitz, Anais Bot. Herb. Barbosa Rodrigues 4:15, pl. 4. 1952. Brazil.

14. V. BARCLAYANA (Baker) L. B. Smith, Contr. U. S. Nat. Herb. 29:517, fig. 75. 1951. Tillandsia barclayana Baker, Journ. Bot. 25:239. 1887. T. lateritia André, Énum. Bromél. 6. Dec. 13,

1888; Rev. Hort. 60:566. Dec. 16, 1888. Ecuador.

15. V. PATULA (Mez) L. B. Smith, Phytologia 5:288. 1955. Tillandsia patula Mez, Fedde Rep. Nov. Spec. 3:35. 1906. Ecuador, Peru.

16. V. GRAVISIANA Wittm. Gartenfl. 39:494, figs. 81, 82. 1890. V. lubbersiana hort. ex Wittm. loc. cit., not E. Morr. Pl. I, fig. 12: Terminal spike x 1/6. Brazil.

17. V. SINCORANA Mez, Fedde Rep. Spec. Nov. 12:418. 1913. Brazil.

18. V. SCHWACKEANA Mez in DC. Mon. Phan. 9:590. 1896. Pl. I, fig. 16: Spike x 1/5. Brazil.

19. V. PINOTTII Reitz, Anais Bot. Herb. Barbosa Rodrigues 4: 12, pl. 3. 1952. Brazil.

20. V. FRIBURGENSIS Mez in Mart. Fl. Bras. 3, pt.3;537. 1894.

Var. a. FRIBURGENSIS. Vriesea tweedieana sensu F. Mueller, Gartenfl. 42:738. 1893, in part. Inflorescence distinctly longer than broad; branches erect or suberect; floral bracts all ecarinate, to 35 mm long; flowers all spreading. Pl. I, fig. 17: Spike x 1/4. Brazil.

Var. b. PALUDOSA (L. B. Smith) L. B. Smith, Anais Bot. Herb. Barbosa Rodrigues 4:68. 1952. Vriesea paludosa L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:119, pl. 128. 1943. V. saundersii sensu L. B. Smith, Anais Bot. Herb. Barbosa Rodrigues 2:26, 54. 1950, not E. Morr. Upper floral bracts carinate, about 25 mm long; upper flowers often imbricate. Brazil.

Var. c. TUCUMANENSIS (Mez) L. B. Smith, Anais B ot. Herb. Barbosa Rodrigues 4:68. 1952. Vriesea tucumanensis Mez in DC. Mon. Phan. 9:585. 1896. V. caldasiana Mez, op. cit. 607. V. argentinensis Spegazzini, Physis 3:158. 1917. V. glutinosa Wawra var. viridis Hassler, Ann. Conserv. & Jard. Bot. Genève 20:319. 1919. Branches spreading to arching-recurved, lax, flowers spreading. Brazil, Paraguay, Argentina.

21. V. BILLBERGIOIDES E. Morr. ex Mez in Mart. Fl. Bras. 3, pt. 3:534, pl. 100. 1894. Brazil.

Var. a. BILLBERGIOIDES. Scape-bracts imbricate; inflorescence bipinnate.

Var. b. SUBNUDA L. B. Smith, Arquiv. Jard. Bot. Rio de Janeiro 10:147. 1951. Scape-bracts lax.

Var. c. AMPLA L. B. Smith, Arquiv. Jard. Bot. Rio de Janeiro 15:330, fig. r. 1958. Inflorescence amply tripinnate.

22. V. LEPTANTHA Harms, Notizblatt 12:532. 1935. Brazil.

23. V. RODIGASIANA E. Morr. Ill. Hort. 29:171, pl. 467. 1882. Tillandsia rodigasiana Baker, Journ. Bot. 26:138. 1888. T. tweedieana Baker, loc. cit. T. citrina Baker, Handb. Bromel. 224. 1889. Vriesea citrina E. Morr. ex Baker, loc. cit. nomen. V. tweedieana F. Mueller, Gartenfl. 42:738. 1893; Mez in Mart. Fl. Bras. 3, pt. 3:561. 1894, as to basonym. V. vitellina F. Mueller, loc. cit. Pl. I, fig. 18. Spike x 1/4. Brazil.

24. V. BRUSQUENSIS Reitz, Anais Bot. Herb. Barbosa Rodrigues 4:10, pl. 2. 1952. Brazil.

25. V. NEOGLUTINOSA Mez, Engl. Pflanzenreich IV. 32:636. 1935. Tillandsia glutinosa Mart. ex Schult. in R. & S. Syst. 7:1225.

1830. Vriesea glutinosa Wawra, It. Sax.-Cob. 167. 1883, not Lindl. 1856. Brazil.

26. V. MUELLERI Mez, Bot. Jahrb. 30, Beibl. 67:7. 1901. Brazil.

27. V. SAUNDERSII (Carr.) E. Morr. ex Mez in Mart. Fl. Bras. 3, pt. 3:540. 1894. Enchlorion saundersii Carr. Rev. Hort. 44: 300. 1872. Tillandsia saundersii K. Koch, Ind. Sem. Hort. Berol. 1873, App. 4:6. 1874. Vriesea botafogensis Mez in Mart. Fl. Bras. 3, pt. 3:536. 1894. Pl. I, figs. 20: Leaf x 1/3; fig. 21: Spike x 1/3. Brazil.

28. V. PROCERA (Mart. ex Schult.) Wittm. Bot. Jahrb. 13, Beibl. 29:21. 1891.

Var. a. PROCERA. Tillandsia procera Mart. ex Schult. in R. & S. Syst. 7:1224. 1830. Vriesea gracilis Gaud. Atl. Voy. Bonite pl. 67. 1843. Tillandsia gracilis Griseb. Nachr. Ges. Wiss. Goett. 1864:17. 1865. T. erectiflora Baker, Journ. Bot. 25:346. 1887. Vriesea catharinensis F. Mueller, Gartenfl. 42:738. 1893. V. procera var. gracilis Mez in Mart. Fl. Bras. 3, pt. 3:540. 1894. Tillandsia viscidula Britton, Bull. Torrey Club 48: 328. 1922. Scape-bracts imbricate; inflorescence amply paniculate; branches divergent to spreading, not twisted; floral bracts even, subcoriaceous, equaling the sepals or slightly shorter, green. Pl. I, fig. 22: Spike x 1/4. Trinidad, Guiana, Brazil.

Var. b. RUBRA L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 2:197. 1952. Bracts red with yellow apices. Brazil.

Var. c. TENUIS L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:121. 1943. Tillandsia gracilis Ule, Bericht. Deutsch. Bot. Gesellsch. 18:325, pl. 10, figs. 7-11. 1900. T. ernestii Mez, Engl. Pflanzenreich IV. 32:636. 1935. Branches spreading to recurving, often twisted so that the flowers are secund; floral bracts membranaceous, nerved, much shorter than the sepals. Brazil.

Var. d. DEBILIS Mez in Mart. Fl. Bras. 3, pt. 3:540. 1894. Scape-bracts nearly all shorter than the internodes; inflorescence simple or subsimple; some of the floral bracts incurved. Brazil.

29. V. GRADATA (Baker) Mez in Mart. Fl. Bras. 3, pt. 3:523. 1894. Tillandsia gradata Baker, Journ. Bot. 26:105. 1888. Brazil.

30. V. MODESTA Mez, Bot. Jahrb. 30, Beibl. 67:7. 1901. Brazil

31. V. ERYTHRODACTYLON E. Morr. ex Mez in DC. Mon. Phan. 9: 569. 1896. Vriesea psittacina var. erythrodactylon E. Morr. Belg. Hort. 32:287. 1882. Tillandsia carinata sensu Baker, Handb. Bromel. 212. 1889, in part, not as to type. Vriesea duvaliana sensu Wittm. Bot. Jahrb. 13, Beibl. 29:21. 1891, not E. Morr. V. carinata sensu Mez in Mart. Fl. Bras. 3, pt. 3:518. 1894, in part, not as to type. Pl. II, fig. 3: Spike x 1/4. Brazil.

32. V. BARILLETII E. Morr. Belg. Hort. 33:33, pl. 3. 1883; L. B. Smith, Phytologia 8:507. 1963. Vriesea eumorpha hort. ex Carr. Rev. Hort. 55:394. 1883, nomen. Tillandsia barilletii Baker, Journ. Bot. 26:79. 1888. Vriesea crotalophora hort. ex

Baker, Handb. Bromel. 215. 1889, nomen. Pl. II, fig. 5: Spike x 1/4. Brazil.

33. V. VULPINOIDEA L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:122, pl. 134. 1943. Brazil.

34. V. INCURVATA Gaud. Atl. Voy. Bonite pl. 68. 1843. Vriesea psittacina var. truffautiana André, Journ. Soc. Hort. France III. 3:89. 1881. V. inflata sensu André, Rev. Hort. 59:44. 1887, as Tillandsia, not Wawra. Tillandsia incurvata Baker, Journ. Bot. 26:49. 1888, not C. Wright, 1871. Vriesea truffautiana hort. ex Baker, Handb. Bromel. 213. 1889, nomen. Vriesea rostrum-aquilae Mez in Mart. Fl. Bras. 3, pt. 3:518, pl. 107. 1894. V. duvaliana sensu Alexander, Addisonia 19:47, pl. 632. 1936, not E. Morr. Pl. II, fig. 6: Spike x 1/4. Brazil.

35. V. INFLATA (Wawra) Wawra, It. Sax.-Cob. 161. 1883. Vriesea carinata var. inflata Wawra, Oesterr. Bot. Zeitschr. 30:183. 1880. Tillandsia inflata Baker, Bot. Mag. pl. 6882. 1886, as to basonym. Vriesea incurvata var. inflata Mez in Mart. Fl. Bras. 3, pt. 3:522. 1894. Pl. II, fig. 7: Spike x 1/4. Brazil.

36. V. PETROPOLITANA L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:120, pl. 130. 1943. Vriesea incurvata sensu E. Morr. Belg. Hort. 32:52, pl. 2. 1882, not Gaud. 1846. Tillandsia inflata Baker, Bot. Mag. pl. 6882. 1886, as to material and plate but not as to basonym of Wawra. Pl. II, fig. 8: Spike x 1/4. Brazil.

37. V. SPLENDENS (Brongn.) Lem. Fl. Serres 6, Misc.:162, fig. 1850-51.

Var. a. SPLENDENS. Tillandsia splendens Brongn. Ann. Fl. Pomone 18:311. 1845. Vriesea speciosa Hook. Bot. Mag. 74:pl. 4382. 1848. Tillandsia vittata Rich. ex Baker, Handb. Bromel. 215. 1889, nomen. T. picta hort. ex Baker, loc. cit., nomen. T. zebrina hort. ex Baker, loc. cit., nomen, not op. cit. 17. Leaf-blades with broad irregular cross-bands. Pl. II, fig. 9: Leaf-blade x 1/4; fig. 10: Spike x 1/4. Guiana, Venezuela.

Var. b. LONGIBRACTEATA (Baker) L. B. Smith, Smithsonian Misc. Coll. 126:36. 1955. Tillandsia longibracteata Baker, Journ. Bot. 26:81. 1888. Vriesea splendens var. formosa Witte, Semperv. 18: 361. 1889. Tillandsia splendens var. formosa Suringar ex Witte, loc. cit., nomen. Tillandsia appuniana Baker, Handb. Bromel.213. 1889. Vriesea longibracteata Mez in DC. Mon. Phan. 9:568. 1896. V. splendens major hort. Duval, Rev. Hort. 69:307. 1897, nomen. V. longibracteata wartelii hort. Rev. Hort. 70:246. 1898, nomen. Leaf-blades concolorous. Trinidad, Guiana, Venezuela.

38. V. CARINATA Wawra, Oesterr. Bot. Zeitschr. 12:349. 1862. Vriesea brachystachys Regel, Gartenfl. 15:258, pl. 518. 1866. V. psittacina var. brachystachys E. Morr. Belg. Hort. 20:161. 1870. V. psittacina var. carinata E. Morr. Belg. Hort. 32:287, pls. 10-12, fig. 1. 1882. Tillandsia carinata Baker, Journ. Bot. 26: 49. 1888. T. psittacina sensu E. Morton, Brazil Fl. 2:pl. 43. 1893. Pl. II, fig. 11: Spike x 1/4. Brazil.

39. V. DUVALIANA E. Morr. Belg. Hort. 34:105, pls. 7, 8. 1884. Vriesea psittacina var. duvaliana André, Rev. Hort. 56:559. 1884. Tillandsia duvaliana Baker, Journ. Bot. 26:48. 1888. Pl. II,

fig. 12: Spike x 1/4. Brazil.

40. V. PARAÏBICA Wawra, It. Sax.-Cob. 160, pl. 33, fig. B, pl. 36, fig. B. 1883. Vriesea carinata var. constricta Wawra, Oesterr. Bot. Zeitschr. 30:183. 1880. Tillandsia paraibica Baker, Journ. Bot. 26:82. 1888, as "parabaica". T. carinata var. constricta Baker, Handb. Bromel. 212. 1889. Vriesea squamosa E. Morr. ex Baker, loc. cit., nomen. Pl. II, fig. 13: Spike x 1/4. Brazil.

41. V. RHODOSTACHYS L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:121, pl. 132. 1943. Brazil.

42. V. PAUCIFLORA Mez, Fedde Rep. Spec. Nov. 16:72. 1919. Brazil.

43. V. BIGUASSUENSIS Reitz, Anais Bot. Herb. Barbosa Rodrigues 4:8, pl. 1. 1952. Brazil.

44. V. LAXA Mez in DC. Mon. Phan. 9:578. 1896, emend. L. B. Smith, Phytologia 7:4. 1959. Tillandsia laxa Griseb. Nachr. Ges. Wiss. Goett. 1864:18. 1865, not Griseb. Fl. Brit. W. Ind. 596. 1864. Venezuela.

45. V. MAXONIANA (L. B. Smith) L. B. Smith, Phytologia 6:441. 1959. Tillandsia maxoniana L. B. Smith, Contr. Gray Herb. 124: 11, pl. 2, figs. 1-3. 1939. Vriesea icterica Castellanos, Lilloa 11:150. 1945; Gen. & Sp. Pl. Argent. 3:249, pl. 70. 1945. Bolivia, Argentina.

46. V. AMETHYSTINA E. Morr. Belg. Hort. 34:330, pls. 15, 16. 1884. Tillandsia amethystina Baker, Journ. Bot. 26:104. 1888. Pl. III, fig. 3: Spike x 1/4. Brazil.

47. V. PSITTACINA (Hook.) Lindl. Bot. Reg. 29:pl. 10. 1843.

Var. a. PSITTACINA. Tillandsia psittacina Hook. Bot. Mag. 55: pl. 2841. 1828. Floral bracts red with yellowish apices, ecarinate. Pl. III, fig. 4: Spike x 1/4. Brazil.

Var. b. RUBRO-BRACTEATA Hook. Bot. Mag. 85:pl. 5108. 1859. Vriesea psittacina var. bracteis omnino coccineis E. Morr. Belg. Hort. 32:287. 1882. V. krameri E. Morr. op. cit. 34:369. 1884. Floral bracts wholly red. Brazil (?).

Var. c. DECOLOR Wawra, Oesterr. Bot. Zeitschr. 30:183. 1880. Floral bracts wholly green, some of them more or less carinate. Brazil, Paraguay.

48. V. RECURVATA Gaud. Atl. Voy. Bonite pl. 69. 1843. Tillandsia recurvata Baker, Journ. Bot. 26:106. 1888, not L. 1762. T. decurvata Baker, Handb. Bromel. 216. 1889. Pl. III, fig. 5: Spike x 1/4. Brazil.

49. V. MORRENIANA hort. ex E. Morr. Belg. Hort. 32:289. 1882. Vriesea psittacina x brachystachys E. Morr. Belg. Hort. 29:300. 1879. V. psittacina var. morreniana E. Morr. Belg. Hort. 32:287, pls. 10-12, fig. 3. 1882. V. carinata x psittacina Mez in Mart. Fl. Bras. 3, pt. 3:528. 1894. Pl. III, fig. 6: Spike x 1/4. Brazil.

50. V. ENSIFORMIS (Vell.) Beer, Bromel. 92. 1857. Brazil.

Var. a. ENSIFORMIS. Tillandsia ensiformis Vell. Fl. Flum. 133. 1825; Icon. 3:pl. 129. 1835. Vriesea conferta Gaud. Atl. Voy. Bonite pl. 65. 1843. V. conferta var. recurvata Wawra, Oesterr. Bot. Zeitschr. 30:184. 1880, in part as to Wawra collec-

tions. Tillandsia selloana Baker, Journ. Bot. 26:104. 1888. T. heterostachys Baker, op. cit. 106. T. crousseana hort. Makoy, Rev. Hort. 60:203. 1890. Vriesea crousseana Rev. Hort. Belg. 19: 258. 1893. V. selloana Mez in Mart. Fl. Bras. 3, pt. 3:547. 1894. Leaf-blades concolorous; floral bracts coriaceous throughout, bright red. Pl. III, fig. 7: Spike x 1/4.

Var. b. STRIATA Alvim Seidel, Brom. Soc. Bull. 13:89, fig. 1963. Leaf-blades striped with creamy yellow.

Var. c. WARMINGII (E. Morr.) L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:116. 1943. Vriesea warmingii E. Morr. Belg. Hort. 34:260, pls. 12, 13. 1884. Tillandsia warmingii Baker, Journ. Bot. 26:104. 1888.

Var. d. BICOLOR L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:116. 1943.

51. V. PARDALINA Mez in Mart. Fl. Bras. 3, pt. 3:523. 1894. Tillandsia guttata Baker, Journ. Bot. 26:108. 1888, in part, not as to type. Pl. IV, fig. 7: Leaf-apex x 1/4; fig. 8: Spike x 1/4. Brazil.

52. V. GUTTATA Linden & André, Ill. Hort. 22:43, pl. 200. 1875. Tillandsia guttata Baker, Journ. Bot. 26:108. 1888. T. duvaliana Baker, Handb. Bromel. 212. 1889, in part. Pl. IV, fig. 9: Leaf-apex x 1/4; fig. 10: Spike x 1/4. Brazil.

53. V. OBLIQUA Quintus ex Wittm. Gartenfl. 41:201, pl. 1369. 1892. Brazil.

54. V. RETROFLEXA E. Morr. Belg. Hort. 34:185, pl. 10. 1884. Vriesea psittacina x simplex Mez in Mart. Fl. Bras. 3, pt. 3:525. 1894. V. psittacina x scalaris E. Morr. ex Mez in DC. Mon. Phan. 9:578. 1896. Pl. IV, fig. 11: Spike x 1/4. Brazil.

55. V. SIMPLEX (Vell.) Beer, Bromel. 97. 1857. Tillandsia simplex Vell. Fl. Flum. 133. 1825; Icon. 3:pl. 130. 1835. Vriesea scalaris sensu Antoine, Phyto-Icon. 30:pl. 19. 1884, not E. Morr. 1879. V. mesiana Hort. Makoy, Rev. Hort. 70:246. 1898, nomen. Pl. IV, fig. 12: Flower x 1. Trinidad, Venezuela, Colombia, Brazil.

56. V. SCALARIS E. Morr. Belg. Hort. 29:301. 1879.

Var. a. SCALARIS. Tillandsia scalaris Baker, Journ. Bot. 26: 108. 1888. Floral bracts red with yellow apices. Pl. IV, fig. 13: Flower x 1; fig. 14: Spike x 1/4. Brazil.

Var. b. VIRIDIS Mez in DC. Mon. Phan. 9:578. 1896. Floral bracts and the remainder of the inflorescence green. Brazil (?).

57. V. DELICATULA L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:58, pl. 76. 1941. Brazil.

58. V. PHILIPPOCOBURGII Wawra, Oesterr. Bot. Zeitschr. 30:219. 1880. Tillandsia philippocoburgii Baker, Journ. Bot. 26:138. 1888. Pl. IV, fig. 18: Branch x 1/4. Brazil.

59. V. VAGANS (L. B. Smith) L. B. Smith, comb. nov. Vriesea philippocoburgii var. vagans L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:121, pl. 131. 1943. Brazil.

NOTE: Mulford Foster, Padre Raulino Reitz, and Mrs. Ada Abendroth, all consider tha above a distinct species because of their experience with it in the field and in cultivation. Accordingly I am following this unity of opinion and publishing the necessary

combination to elevate the group to specific rank.

60. V. INTERROGATORIA L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:117, pl. 124. 1943. Brazil.

61. V. CORCOVADENSIS (Britten) Mez in Mart. Fl. Bras. 3, pt. 3:532. 1894. Tillandsia ventricosa Wawra, Oesterr. Bot. Zeitschr. 30:222. 1880, not Griseb. 1865. T. corcovadensis Britten, Journ. Bot. 26:172. 1888. T. oligantha Baker, Handb. Bromel. 215. 1889, in part, not as to type. Vriesea rubida E. Morr. ex Mez in Mart. Fl. Bras. 3, pt. 3:574. 1894. V. ventricosa Mez in DC. Mon. Phan. 9:583. 1896. Brazil.

62. V. POENULATA (Baker) E. Morr. ex Mez in Mart. Fl. Bras. 3, pt. 3:573, pl. 106. 1894. Tillandsia glaziovii E. Morr. ex Baker, Handb. Bromel. 229. 1889. T. poenulata Baker, op. cit. 230. Brazil.

63. V. FLAMMEA L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:59, pl. 79. 1941, not hort. Duval 1902, nomen. Pl. VI, fig. 3: Leaf x 1/4; fig. 4:Spike x 1/4. Brazil.

Section XIPHION

64. V. CHONTALENSIS (Baker) L. B. Smith, Contr. U. S. Nat. Herb. 29:518, fig. 76. 1951. Tillandsia chontalensis Baker, Journ. Bot. 25:237. 1887. T. spuria Mez & Werckle, Fedde Rep. Spec. Nov. 16:74. 1919. Nicaragua to Peru.

65. V. CRENULIPETALA (Mez) L. B. Smith, Phytologia 5:288. 1955. Tillandsia crenulipetala Mez, Fedde Rep. Spec. Nov. 16:76. 1919. T. attenuata Rusby, Descr. So. Am. Pl. 4. 1920. Colombia.

66. V. APPENDICULATA (L. B. Smith) L. B. Smith, Contr. U. S. Nat. Herb. 29:445. 1951. Tillandsia appendiculata L. B. Smith, Lloydia 11:307, fig. 6. 1949. Ecuador.

67. V. HETERANDRA (André) L. B. Smith, Contr. U. S. Nat. Herb. 29:443. 1951. Tillandsia heterandra André, Énum. Bromél. 7. Dec. 13, 1888; Rev. Hort. 60:567. Dec. 16, 1888. Venezuela to Bolivia

68. V. LACERA (L. B. Smith) L. B. Smith, Fieldiana Bot. 28: 831. 1957. Tillandsia lacera L. B. Smith, op. cit. 28:150, fig. 22 D-F. 1951. Venezuela.

69. V. DIDISTICHOIDES (Mez) L. B. Smith, Phytologia 5:281. 1955. Tillandsia didistichoides Mez in DC. Mon. Phan. 9:778. 1896. Pl. I, fig. 5: Spike x 1/4. Mexico, West Indies, Venezuela, Colombia.

70. V. FRAGRANS (André) L. B. Smith, Contr. U. S. Nat. Herb. 29:443. 1951. Tillandsia fragrans André, Énum. Bromél. 7. Dec. 13, 1888; Rev. Hort. 60:567. Dec. 16, 1888. Pl. I, fig. 6: Spike x 1/4. Colombia, Ecuador.

71. V. DREWII L. B. Smith, Phytologia 5:401, pl. 1, figs. 4-7. 1956. Ecuador.

72. V. DREPANOCARPA (Baker) Mez In DC. Mon. Phan. 9:581. 1896. Tillandsia drepanocarpa Baker, Journ. Bot. 26:41. 1888. Vriesea dusenii L. B. Smith, Contr. Gray Herb. 98:17, pl. 5, figs. 3, 4. 1932. Pl. I, fig. 11: Spike x 1/2. Brazil.

73. V. GONIORACHIS (Baker) Mez in Mart. Fl. Bras. 3, pt. 3: 545. 1894. Tillandsia goniorachis Baker, Journ. Bot. 25:303.

1887. Brazil.

74. V. JIMENEZII Mez & Tonduz, Fedde Rep. Spec. Nov. 14:246. 1916. Costa Rica.

75. V. SULCATA L. B. Smith, Mem. New York Bot. Gard. 9:315, fig. 58. 1957. Venezuela.

76. V. FUNEBRIS L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:117, pl. 122. 1943. Brazil.

77. V. SODERSTROMII L. B. Smith, Bromeliad Soc. Bull. 13:52, fig. 1963. British Guiana.

78. V. GLUTINOSA Lindl. Gard. Chron. 388. 1856. Tillandsia glutinosa sensu Griseb. Fl. Brit. W. Ind. 597. 1864, not Mart. ex Schult. 1830. T. stenostachya Baker, Journ. Bot. 26:109. 1888. Vriesea stenostachya Mez In DC. Mon. Phan. 9:564. 1896. Pl. I, fig. 13: Spike x 1/8; fig. 14: Sepal x 1. Trinidad.

79. V. ELATA (Baker) L. B. Smith, Phytologia 5:288. 1955. Tillandsia elata Baker, Journ. Bot. 26:46. 1888. T. excelsa Mez, wrongly attributed to Wittm., in DC. Mon. Phan. 9:766. 1896. T. exaltata Mez, loc. cit. Colombia.

80. V. CHRYSOSTACHYS E. Morr. Belg. Hort. 31:87. 1881.

Var. a. CHRYSOSTACHYS. Tillandsia chrysostachys Baker, Bot. Mag. 112:pl. 6906. 1886. T. trinitensis Baker, Handb. Bromel. 211. 1889. Vriesea aurea hort. ex Baker, op. cit. 222, nomen. V. cryptantha hort. ex Baker, loc. cit., nomen. Leaves rounded and apiculate or broadly acute, 4-5 cm wide; inflorescence simple or rarely digitate; petals yellow. Pl. I, fig. 15: Inflorescence x 1/8. Trinidad, Colombia, Peru.

Var. b. STENOPHYLLA L. B. Smith, Bot. Mus. Leafl. Harvard 17: 71. 1955. Leaves acuminate, about 1 cm wide; inflorescence simple; petals white. Colombia.

81. V. CAMPTOCLADA Mez & Wercklé, Fedde Rep. Spec. Nov. 14: 247. 1916. Costa Rica.

82. V. HODGEI L. B. Smith, Caldasia 5:14, fig. 1948. Colombia.

83. V. SUBANDINA (Ule) Sm. & Pitt. Journ. Wash. Acad. Sci. 43: 404. 1953. Cipuropsis subandina Ule, Verhandl. Bot. Ver. Brandenb. 48:148. 1907. Tillandsia subandina Mez ex L. B. Smith, Contr. Gray Herb. 98:16. 1932. Peru.

84. V. RUBRA (R. & P.) Beer, Bromel. 98. 1857. Tillandsia rubra R. & P. Fl. Per. 3:40, pl. 266. 1802. Vriesea albiflora Ule, Verhandl. Bot. Ver. Brandenb. 48:141. 1907. Tillandsia rhododactyla Mez, Fedde Rep. Spec. Nov. 16:76. 1919. Trinidad, northern South America.

85. V. PEDICELLATA (Mez & Wercklé) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum pedicellatum Mez & Wercklé, Bull. Herb. Boiss. II. 3:136. 1903. Costa Rica.

86. V. SCEPTRUM Mez in DC. Mon. Phan. 9:606. 1896. Brazil.

87. V. EGREGIA L. B. Smith, Phytologia 4:355, pl. 1, figs. 4-6. 1953. Venezuela.

88. V. HOSPITALIS (L. B. Smith) L. B. Smith, Phytologia 5:397. 1956. Tillandsia hospitalis L. B. Smith, Caldasia 5:13, fig. 1948. Colombia.

89. V. MAGDALENAE L. B. Smith, Phytologia 8:500, pl. 2, fig.

6-8. 1963. Colombia.

90. V. RANIFERA L. B. Smith, Phytologia 9:242, pl. 1, figs. 1, 2. 1963. Costa Rica.

91. V. THYRSOIDEA Mez in Mart. Fl. Bras. 3, pt. 3:556. 1894. Brazil.

92. V. ALTODASERRAE L. B. Smith, Contr. Gray Herb. 98:16, pl. 5, figs. 1, 2. 1932. Pl. I, fig. 19: Spike x 1/4. Brazil.

93. V. HAEMATINA L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:117, pl. 123. 1943. Brazil.

94. V. MONACORUM L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:119, pl. 127. 1943. Brazil.

95. V. KILLIPIANA L. B. Smith, Phytologia 5:42, pl. 5, figs. 1-3. 1954. Colombia.

96. V. GIGANTEA Gaud. Atl. Voy. Bonite pl. 70 (except the base of the inflorescence erroneously shown as simple). 1843. Tillandsia gigantea Griseb. Fl. Brit. W. Ind. 597. 1864. T. tessellata Linden, Catal. 9. 1873. Vriesea tessellata E. Morr. Belg. Hort. 32:381, pls. 14-16. 1882. Tillandsia reticulata Baker, Gard. Chron. III. 1:140. 1887. Vriesea reticulata Mez in Mart. Fl. Bras. 3, pt. 3:557. 1894. V. mosenii Mez, op. cit. 558. V. alexandrae hort. Sander, Gard. Chron. 245. 1903. Pl. I, fig. 25: Section of spike x 1/2. Brazil.

97. V. PARADOXA Mez in DC. Mon. Phan. 9:604. 1896. Brazil.

98. V. LATISSIMA (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:402. 1953. Thecophyllum latissimum Mez & Werckle, Bull. Herb. Boiss. II. 4:1122. 1904. Costa Rica.

99. V. TURBINATA (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum turbinatum Mez & Werckle, Bull. Herb. Boiss. II. 4:1122. 1904. Costa Rica.

100. V. LANGUIDA L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:118, pl. 125, fig. 1. 1943. Brazil.

101. V. TRILIGULATA Mez in Mart. Fl. Bras. 3, pt. 3:541. 1894. Brazil.

102. V. MACULOSA Mez, Fedde Rep. Spec. Nov. 12:418. 1913. Brazil.

103. V. STRICTA L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:122, pl. 133. 1943. Brazil.

104. V. MINARUM L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:118, pl. 126. 1943. Brazil.

105. V. HELICONIOIDES (HBK.) Hook. ex Walp. Ann. Bot. 3:623. 1852. Tillandsia heliconioides HBK. Nov. Gen. & Sp. 1:293. 1816. T. disticha Willd. ex Schult. in R. & S. Syst. 7:1226. 1830, in synonymy, not Renealmia disticha L. 1759. Vriesea falkenbergii hort. Bull, Gard. Chron. 1:759. 1880. V. bellula hort. Linden, Cat. no. 109:7. 1883. V. disticha Kuntze, Rev. Gen. 3, pt. 2:304. 1898. Guzmania obtusa Rusby, Mem. N. Y. Bot. Gard. 7: 212. 1927. Vriesea bullata hort. ex C. Chevalier, Bull. Soc. Nat.Hort. France V. 3:349. 1930. Pl. II, fig. 4: Spike x 1/4. Central America and Colombia to Bolivia and Brazil.

106. V. LONGICAULIS (Baker) Mez in Mart. Fl. Bras. 3, pt. 3: 542. 1894. Vriesea jonghei sensu Wawra, Oesterr. Bot. Zeitschr. 30:220. 1880, not E. Morr. V. jonghei forma "capsulis secundis",

It. Sax.-Cob. 168. 1883. Tillandsia longicaulis Baker, Journ. Bot. 26:80. 1888. Vriesea longicaulis var. secunda Mez in Mart. Fl. Bras. 3, pt. 3:543. 1894. Brazil.

107. V. PYCNANTHA L. B. Smith, Contr. Gray Herb. 154:38, pl. 4 figs. 10-12. 1945. Guatemala.

108. V. RUGOSA Mez & Werckle, Bull. Herb. Boiss. II. 4:866. 1904. Costa Rica.

109. V. GLADIOLIFLORA (Wendl.) Ant. Wiener Ill. Gart. 5:98. 1880. Tillandsia gladioliflora Wendl. Hamb. Gartenz. 19:31. 1863. Vriesea princeps hort. Linden ex Batal, Gartenfl. 26:158. 1877; E. Morr. Belg. Hort. 30:216. 1880, nomen. Pl. II, fig. 14: Spike x 1/4. Guatemala to Colombia.

110. V. PACHYSPATHA Mez & Werckle, Bull. Herb. Boiss. II. 4: 867. 1904. Costa Rica.

111. V. MACRANTHA Mez & Werckle, Bull. Herb. Boiss. II. 4:867. 1904. Costa Rica.

112. V. OVANDENSIS Matuda, Cact. & Sucul. Mex. 2:78, fig. 51. 1957. Pl. II, fig. 15: Spike x 1/4. Mexico.

113. V. ACUMINATA Mez & Werckle, Bull. Herb. Boiss. II. 4:868. 1904. Costa Rica.

114. V. SCHULTESIANA L. B. Smith, Bot. Mus. Leafl. Harvard 16: 197, fig. 1954. Colombia.

115. V. BRACHYPHYLLA Mez & Werckle, Bull. Herb. Boiss. II. 4: 869. 1904. Costa Rica.

116. V. BRUNEI Mez & Werckle, Bull. Herb. Boiss. II. 4:865. 1904. Costa Rica.

117. V. APICULATA L. B. Smith, Phytologia 8:221, pl. 2, figs. 1-3. 1962. Pl. III, fig. 1: Leaf-apex x 1/4; fig. 2: Spike x 1/4. Costa Rica.

118. V. LANCIFOLIA (Baker) L. B. Smith, Lilloa 6:386, pl. 2, figs. 3, 4. 1941. Tillandsia lancifolia Baker, Handb. Bromel. 202. 1889. Vriesea platzmannii Mez in Mart. Fl. Bras. 3, pt. 3: 546. 1894, in part, not as to type. Brazil.

119. V. PARVIFLORA L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:119, pl. 125, fig. 2. 1943. Brazil.

120. V. MACROSTACHYA (Bello) Mez in DC. Mon. Phan. 9:601. 1896. Caraguata macrostachya Bello, Anal. Soc. Esp. Hist. Nat. 12:122. 1883. Neovriesia macrostachya Britton in Britton & Wilson, Sci. Surv. Porto Rico 5:142. 1923. Cuba, Puerto Rico, Venezuela.

121. V. FENESTRALIS Linden & André, Ill. Hort. 22:124, pl. 215. 1875. Tillandsia fenestralis Hook. f. Bot. Mag. 112:pl. 6898. 1886. Vriesea fenstrata hort. Rev. Hort. 66:285. 1894, nomen. V. hamata L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:59, pl. 77. 1941. Pl. III, fig. 8: Leaf-apex x 1/4; fig. 9: Spike x 1/4. Brazil.

122. V. ATRA Mez in Mart. Fl. Bras. 3, pt. 3:543, pl. 101. 1894. Brazil.

123. V. JONGHEI (K. Koch) E. Morr. Belg. Hort. 28:257. 1878. Encholirion jonghii Libon ex K. Koch, Allg. Gartenz. 22. 1857, nomen. Tillandsia jonghei K. Koch, Wochenschr. 11:91. 1868. Vriesea xiphion Platzmann ex E. Morr. Belg. Hort. 24:291. 1874,

nomen. Encholirion ynghii May, Rev. Hort. 50:140. 1878, probably an error for "jonghei". Vriesea gamba F. Mueller, Flora 83:460. 1897. Pl. IV, fig. 1: Spike x 1/4. Trinidad, Brazil.

124. V. FOSTERIANA L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:116, pl. 121. 1943. Pl. IV, figs. 2: Leaf-apex x 1/4; fig. 3: Section of spike x 1/4. Brazil.

125. V. PLATYNEMA Gaud. Atl. Voy. Bonite pl. 66. 1843.

1. Flowers distichous throughout; sepals all exceeding the floral bracts.
 2. Leaf-blades essentially concolorous.
  3. Leaves rounded and apiculate.
   4. Sepals obtuse.
    5. Scape stout; rhachis 5 mm in diameter or more.
     6. Floral bracts red.....Var. a. platynema
     6. Floral bracts yellow.....Var. b. flava
    5. Scape slender; rhachis scarcely more than 2 mm in diameter.....Var. c. gracilior
   4. Sepals acute.....Var. d. libonii
  3. Leaves acuminate.....Var. e. rosea
 2. Leaf-blades not concolorous.
  7. Leaf-blades pale-striate.....Var. f. striata
  7. Leaf-blades red-violet beneath, green above, pale-striate near apex.....Var. g. variegata
1. Flowers at base of inflorescence polystichous with sepals shorter than the floral bracts.....Var. h. wrightii

Var. a. PLATYNEMA. Tillandsia platynema Griseb. Nachr. Ges. Wiss. Goett. 1864:19. 1865, as to basonym. Encholirion corallinum J. Linden, Catal. 19:27. 1865. Vriesea corallina Regel, Gartenfl. 19:354, pl. 671. 1870. Encholirium corallinum Linden ex André, Ill. Hort. 18:136, pl. 70. 1871. Tillandsia corallina K. Koch, Ind. Sem. Hort. Berol. 1873, App. 4:5. 1874. Tillandsia bicolor sensu Niederlein, Bull. Mens. Prod. Arg. 3:332. 1890. Pl. IV, fig. 4: Leaf-apex x 1/4; fig. 5: Section of spike x 1/4. West Indies, eastern South America.

Var. b. FLAVA Reitz, Anais Bot. Herb. Barbosa Rodrigues 4:15. 1952. Brazil.

Var. c. GRACILIOR L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:121. 1943. Brazil.

Var. d. LIBONII Mez in Mart. Fl. Bras. 3, pt. 3:553. 1894. Encholirion liboni hort. ex Baker, Handb. Bromel. 220. 1889, nomen. Brazil (?).

Var. e. ROSEA (hort. ex Antoine) Mez in Mart. Fl. Bras. 3, pt. 3:552. 1894. Vriesea rosea E. Morr. ex Mez, loc. cit., nomen.

Var. f. STRIATA (Wittm.) Wittm. ex Mez in Mart. Fl. Bras. 3, pt. 3:553. 1894. Vriesea corallina var. striata Wittm. Bot. Jahrb. 13, Beibl. 29:6. 1891. Brazil.

Var. g. VARIEGATA (Guillon) Reitz, Anais Bot. Herb. Barbosa Rodrigues 4:15. 1952. Encholirion roseum variegatum Guillon, Rev. Hort. 55:470. 1883. Brazil.

Var. h. WRIGHTII (L. B. Smith) L. B. Smith, Phytologia 7:174.

1960. Guzmania wrightii L. B. Smith, Contr. Gray Herb. 117:11. 1937. Vriesea wrightii Carabia, Mem. Soc. Cub. Hist. Nat. 15: 361. 1941. Cuba.

126. V. WAWRANEA Ant. Phyto-Icon. 1, pls. 1, 2. 1884. Tillandsia wawranea Baker, Journ. Bot. 26:105. 1888. Brazil.

127. V. BITUMINOSA Wawra, Oesterr. Bot. Zeitschr. 12:347. 1862. Tillandsia platynema sensu Baker, Journ. Bot. 26:106. 1888, in part. Vriesea platynema Wittm. Bot. Jahrb. 13, Beibl. 29:21. 1891. Pl. IV, fig. 6: Base of spike x 1/4. Venezuela, Brazil.

128. V. REGNELLII Mez in Mart. Fl. Bras. 3, pt. 3:548, pl. 102. 1894. Brazil.

129. V. NUTANS L. B. Smith, Phytologia 7:175, pl. 2, figs. 6, 7. 1960. Costa Rica.

130. V. CRASSA Mez in Mart. Fl. Bras. 3, pt. 3:566, pl. 104. 1894. Brazil.

131. V. DENSIFLORA Mez in Mart. Fl. Bras. 3, pt. 3:567. 1894. Brazil.

132. V. DISSITIFLORA (C. Wright) Mez In DC. Mon. Phan. 9:604. 1896. Tillandsia dissitiflora C. Wright in Sauvalle, Anal. Acad. Ci. Habana 8:54. 1872. Vriesea erici Harms, Notizblatt 12:533. 1935. Cuba.

133. V. TUERCKHEIMII (Mez) L. B. Smith, Contr. Gray Herb. 117: 33. 1937. Tillandsia tuerckheimii Mez in Urb. Symb. Ant. 7:174. 1912. Pl. IV, fig. 15: Section of branch x 1/4; fig. 16: Sepal x 1; fig. 17: Petal x 1. Hispaniola.

134. V. SPARSIFLORA L. B. Smith, Contr. Gray Herb. 95:48, pl. 10, figs. 1, 2. 1931. Brazil.

135. V. TRIFLORA Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum panniculatum Mez & Wercklé, Bull. Herb. Boiss. II. 4:1123. 1904, not Vriesea paniculata Mez 1896. Costa Rica.

136. V. DISCOLOR (Mez & Wercklé) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:402. 1953. Thecophyllum discolor Mez & Wercklé, Fedde Rep. Spec. Nov. 14:246. 1916. Costa Rica.

137. V. SWARTZII (Baker) Mez, Engl. Pflanzenreich IV. 32:400. 1935. Tillandsia swartzii Baker, Journ. Bot. 26:12. 1888. Tillandsia paniculata Sw. ex Baker, loc. cit. as synonym, not L. 1762. Jamaica.

138. V. RINGENS (Griseb.) Harms, Notizblatt 10:801. 1929. Tillandsia ringens Griseb. Cat. Pl. Cub. 255. 1866. T. chagresiana Baker, Journ. Bot. 26:109. 1888. T. veitchii Baker, Handb. Bromel. 223. 1889. Vriesea veitchii E. Morr. ex Baker, loc. cit. nomen. V. paniculata Mez in DC. Mon. Phan. 9:614. 1896, as to Tillandsia ringens Griseb. not as to basonym. Pl. IV, fig. 19: Branch x 1/2. Costa Rica to Colombia, West Indies.

139. V. MORRENII Wawra, Oesterr. Bot. Zeitschr. 30:219. 1880. Vriesea morrenii var. disticha Wawra, op. cit. 220. Tillandsia morrenii Baker, Journ. Bot. 26:139. 1888. Brazil.

140. V. RUSCHII L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:59, pl. 78. 1941. Brazil.

141. V. HOEHNEANA L. B. Smith, Proc. Am. Acad. 68:150, pl. 1,

figs. 11-13. 1933. Vriesea tweedieana Mez in DC. Mon. Phan. 9: 608. 1896, in part (?), not as to basonym. V. tessellata sensu Hoehne, Album Sec. Bot. Mus. Paulista 97, fig. 1925, not E. Morr. Brazil.

142. V. AMAZONICA (Baker) Mez in Mart. Fl. Bras. 3, pt. 3:554. 1894. Tillandsia gigantea Mart. ex Schult. in R. & S. Syst. 7: 1224. 1830. T. amazonica Baker, Journ. Bot. 26:108. 1888. Vriesea gigantea Mez in Mart. Fl. Bras. 3, pt. 3:566. 1894, not Gaud. 1846. Trinidad, Guiana, Amazonian Brazil.

143. V. ITATIAIAE Wawra, Oesterr. Bot. Zeitschr. 30:221. 1880. Tillandsia itatiaiae Baker, Journ. Bot. 26:110. 1888. Vriesea schenckiana Wittm. Bot. Jahrb. 13, Beibl. 29:20. 1891. Pl. V, fig. 1: Branch x 1/4. Brazil.

144. V. CONFUSA L. B. Smith, sp. nov. A V. camptoclada Mez & Werckle, cui affinis, inflorescentia pauciramosa, spicarum basibus sterilibus elongatis multibracteatisque differt.

PLANT flowering 9-10 dm high. LEAVES rosulate, to 8 dm long, minutely and obscurely lepidote throughout; sheaths broadly elliptic, ca. 15 cm long, nearly black beneath; blades ligulate, broadly acute with a stout involute terminal cusp, 7-8 cm wide, flat. SCAPE erect, rather slender; scape-bracts strict, imbricate, the lowest subfoliaceous, the others broadly ovate with a cuspidate apex. INFLORESCENCE typically of 2 branches with long sterile laxly bracteate bases; spikes oblong, densely many-flowered, 15-17 cm long (fertile part); rhachis nearly straight, subalate, 4 mm wide; floral bracts 3 times the internodes but spreading at anthesis and exposing the rhachis, not secund, broadly ovate, rounded and apiculate, 25 mm long, very broadly convex and ecarinate, coriaceous, even, glabrous, green (! Foster); flowers slightly secund at anthesis; pedicels slenderly obconic, to 10 mm long in fruit. SEPALS broadly elliptic, 17 mm long, ecarinate, coriaceous, even; petals oblong, exceeding the stamens, white, musky and opening at night (! Foster). CAPSULE cylindric, acute, beaked, 3 cm long. Pl. V, fig. 2: Inflorescence x 1/6; fig. 3: Sepal x 1.

COLOMBIA: Nariño: Epiphytic, Barbacoas, 17 November 1946, M. B. Foster 2193 (US, type).

145. V. CORNUS-CERVI Rohweder, Univ. Hamburg, Abh. Geb. Auslandsk. 61, Reihe C, Naturwiss. 18:82, figs. 79, 89. 1956. Salvador.

146. V. HIEROGLYPHICA (Carr.) E. Morr. Ill. Hort. 31:41, pl. 514. 1884. Massangea hieroglyphica Carr. Rev. Hort. 50:175, figs. 33, 34. 1878. Tillandsia hieroglyphica Baker, Journ. Bot. 26:110. 1888. Massangea santoviensis hort. ex Baker, Handb. Bromel. 149. 1889, nomen. M. tigrina hort. ex Baker, op. cit. 224, nomen. Pl. V, fig. 6: Leaf-apex x 1/4; fig. 7: Branch x 1/4. Brazil.

147. V. PENDULIFLORA L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:120, pl. 129. 1943. Brazil.

148. V. SEGADAS-VIANNAE L. B. Smith, Smithsonian Misc. Coll. 126:35, 120, fig. 40. 1955. Brazil.

149. V. WERCKLEANA Mez, Bull. Herb. Boiss. II. 3:136. 1903.

Pl. V, fig. 8: Apex of branch x 1/4. Mexico, Guatemala, Costa Rica.

150. V. KUPPERIANA Suessenguth, Bot. Arkiv 39:384, fig. 1. 1939. Costa Rica.

151. V. SANGUINOLENTA Cogn. & March. Pl. Ornem. pl. 52. 1874. Tillandsia sanguinolenta Baker, Handb. Bromel. 226. 1889. Vriesea alfarovii Mez, Fedde Rep. Spec. Nov. 14:247. 1916. Encholirion sanguinolentum hort. ex C. Chevalier, Bull. Soc. Nat. Hort. France V. 3:349. 1930. Vriesea urbaniana Harms, Notizblatt 12: 532. 1935. Pl. V, fig. 9: Branch x 1/5. Costa Rica to Colombia, Greater Antilles.

152. V. LONGISCAPA Ule, Bericht. Deutsch. Bot. Gesellsch. 18: 323. 1900. Brazil.

153. V. CEARENSIS L. B. Smith, Phytoligia 7:255, pl. 1, figs. 11, 12. 1960. Brazil.

154. V. HYDROPHORA Ule, Arch. Mus. Nac. Rio de Janeiro 10:189. 1899; Bericht. Deutsch. Bot. Gesellsch. 17:2. 1899. Brazil.

155. V. PASTUCHOFFIANA Glaziou ex Mez in Mart. Fl. Bras. 3, pt. 3:564. 1894. Tillandsia pastuchoffiana hort. ex Baker, Handb. Bromel. 226. 1889, nomen. Brazil.

156. V. PECTINATA L. B. Smith, Lilloa 6:387, 393, pl. 1, figs. 10-13. 1941. Guatemala.

157. V. CLAUSSENIANA (Baker) Mez in Mart. Fl. Bras. 3, pt. 3: 545. 1894. Tillandsia clausseniana Baker, Handb. Bromel. 213. 1889. Brazil.

158. V. WOODSONIANA L. B. Smith, Ann. Missouri Bot. Gard. 26: 275, pl. 20. 1939. Panama.

159. V. PACHYCHLAMYS Mez in DC. Mon. Phan. 9:594. 1896. Tillandsia pachychlamys Baker ex Mez, loc. cit., nomen. British Guiana.

160. V. TONDUZIANA L. B. Smith, No. Am. Fl. 19:166. 1938; Lilloa 6:397, pl. 2, figs. 18, 19. 1941. Costa Rica.

161. V. VANHYNINGII L. B. Smith, Phytologia 7:173, pl. 2, figs. 1-3. 1960. Pl. V, fig..10: Leaf-apex x 1/4; fig. 11: Spike x 1/4. Mexico.

162. V. UNILATERALIS (Baker) Mez in Mart. Fl. Bras. 3, pt. 3: 545. 1894. Tillandsia unilateralis Baker, Journ. Bot. 26:105. 1888. Brazil.

163. V. BICOLOR L. B. Smith, Phytologia 7:174, pl. 2, figs. 4, 5. 1960. Costa Rica.

164. V. GUADELUPENSIS (Baker) Mez in DC. Mon. Phan. 9:596. 1896. Tillandsia guadelupensis Baker, Handb. Bromel. 213. 1889. Neovriesia guadalupensis Britton ex Stehlé, Fl. Guadeloupe 1:212. 1936, nomen. Lesser Antilles.

165. V. SUBSECUNDA Wittm. Bot. Jahrb. 11:69. 1889. Tillandsia subsecunda Baker, Handb. Bromel. 217. 1889. Vriesea diminuta Mez & Wercklé, Bull. Herb. Boiss. II. 4:869. 1904. Costa Rica, Panama.

166. V. PITTIERI Mez, Bull. Herb. Boiss. II. 3:135. 1903. Costa Rica.

167. V. AMPLA L. B. Smith, Phytologia 8:497, pl. 1, figs. 4-6. 1963. Costa Rica.

168. V. VIRIDIFLORA (Regel) Wittm. ex Mez, Engl. Pflanzenreich IV. 32:387. 1935. Pitcairnia viridiflora Regel, Ind. Sem. Hort. Petrop. 1866:81. 1867. Tillandsia viridiflora Regel, loc. cit., nomen. Vriesea viminalis E. Morr. Belg. Hort. 28:257, pl. 14, 15. 1878. Tillandsia viminalis Hemsl. Biol. Centr. Am. Bot. 3: 323. 1884. Pl. V, fig. 12: Spike x 1/4. Central America, British Guiana, Venezuela, Colombia.

169. V. MARNIER-LAPOSTOLLEI L. B. Smith, Bromel. Soc. Bull. 14:108, figs. 1964. Pl. V, fig. 13: Spike-apex x 1/4. Costa Rica.

170. V. HAPLOSTACHYA (C. Wright) L. B. Smith, Contr. Gray Herb. 114: 9, pl. 2, fig. 6. 1936. Tillandsia haplostachya C. Wright in Sauvalle, Anal. Acad. Ci. Habana 8:73. 1871. Cuba.

171. V. CHIAPENSIS Matuda, Anal. Inst. Biol. Mexico 23:130. 1953. Mexico.

172. V. GRAMINIFOLIA Mez & Wercklé, Bull. Herb. Boiss. II. 4: 868. 1904. Costa Rica.

173. V. BRASSICOIDES (Baker) Mez in DC. Mon. Phan. 9:598. 1896. Tillandsia brassicoides Baker, Journ. Bot. 26:12. 1888. Brazil.

174. V. FIBROSA L. B. Smith, Mem. New York Bot. Gard. 9:315, fig. 59. 1957. Venezuela.

175. V. SOCIALIS L. B. Smith, Bot. Mus. Leafl. Harvard 12:121, fig. 1946. Colombia.

176. V. PLATZMANNII E. Morr. Belg. Hort. 25:349, pl. 23. 1875. Tillandsia platzmannii Baker, Journ. Bot. 26:104. 1888. Brazil.

177. V. VERRUCOSA L. B. Smith, Phytologia 5:44, pl. 5, figs. 4, 5. 1954. Colombia.

178. V. SCHIPPII L. B. Smith, Contr. Gray Herb. 98:18, pl. 5, figs. 5, 6. 1932. British Honduras.

179. V. MACROCHLAMYS Mez & Wercklé, Bull. Herb. Boiss. II. 4: 865. 1904. Costa Rica.

180. V. OLIGANTHA (Baker) Mez in Mart. Fl. Bras. 3, pt. 3:544. 1894. Tillandsia oligantha Baker, Journ. Bot. 25:345. 1887. Brazil.

181. V. BROADWAYI L. B. Smith, Proc. Am. Acad. Arts & Sci. 68: 149, pl. 1, figs. 9, 10. 1933. Pl. V, fig. 14: Leaf-apex x 1/4; fig. 15: Spike x 1/4. Trinidad.

182. V. RACINAE L. B. Smith, Lilloa 6:387, 413, pl. 3, figs. 5, 6. 1941. Pl. V, fig. 16: Leaf x 1/4; fig. 17: Spike x 1/4. Brazil.

183. V. VEXILLATA L. B. Smith, Bot. Mus. Leafl. Harvard 17:72, pl. 21, figs. 1, 2. 1955. Colombia.

184. V. SPLITGERBERI (Mez) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Guzmania splitgerberi Mez in DC. Mon. Phan. 9:930. 1896. Thecophyllum splitgerberi Pittendrigh, Evolution 2:60. 1948. Pl. V, fig. 18: Leaf-apex x 1/4; fig. 19: Spike x 1/4. Costa Rica, Trinidad, Guiana, Venezuela, Colombia.

185. V. DIFFUSA Sm. & Pitt. Journ. Wash. Acad. Sci. 43:402. 1953. Thecophyllum laxum Mez & Werckle, Bull. Herb. Boiss. II. 4:1123. 1904, not Vriesea laxa Mez, 1896. Costa Rica.

186. V. CAPITULIGERA (Griseb.) Sm. & Pitt. Journ. Wash. Acad.

Sci. 43:402. 1953. Tillandsia capituligera Griseb. Cat. Pl. Cub. 254. 1866. T. fastuosa André, Énum. Bromél. 8. Dec. 13, 1888; Rev. Hort. 60:568. Dec. 16, 1888. Guzmania fastuosa André ex Mez in DC. Mon. Phan. 9:926. 1896. G. capituligera Mez, loc. cit. Schlumbergeria capituligera Harms, Notizblatt 10:804. 1929. Thecophyllum capituligerum L. B. Smith, Contr. Gray Herb. 98:14. 1932. T. fastuosum Mez, Engl. Pflanzenreich IV. 32:423, fig. 90. 1935. Pl. V, fig. 20: Spike x 1/4. West Indies, Venezuela, Colombia, Ecuador.

187. V. CRASSIFLORA (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:402. 1953. Thecophyllum crassiflorum Mez & Werckle, Bull. Herb. Boiss. II. 3:138. 1903. Costa Rica.

188. V. CYLINDRACEA (Suessenguth & Goeppinger) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:402. 1953. Thecophyllum cylindraceum Suessenguth & Goeppinger, Bot. Jahrb. 72:292. 1942. Costa Rica.

189. V. LEPTOPODA Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum rubrum Mez & Werckle, Bull. Herb. Boiss. II. 4:878. 1904, not Vriesea rubra Beer, 1857. Costa Rica.

190. V. BRACTEOSA (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:402. 1953. Thecophyllum bracteosum Mez & Werckle, Fedde Rep. Spec. Nov. 14:246. 1916. Costa Rica.

191. V. NEPHROLEPIS Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403 1953. Thecophyllum werckleanum Mez, Bull. Herb. Boiss. II. 3: 139. 1903, not Vriesea werckleana Mez, 1903. Costa Rica.

192. V. MONTANA (L. B. Smith) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:69. 1953. Thecophyllum montanum L. B. Smith, Field Mus. Pub. Bot. 17:319, pl. 7. 1938. Guatemala, Honduras.

193. V. VIOLASCENS (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum violascens Mez & Werckle, Bull. Herb. Boiss. II. 4:877. 1904. Costa Rica.

194. V. LEUCOPHYLLA L. B. Smith, Phytologia 8:498, pl. 2, figs. 1, 2. 1963. Costa Rica.

195. V. SPECTABILIS (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum spectabile Mez & Werckle, Bull. Herb. Boiss. II. 4:873. 1904. Costa Rica.

196. V. COMATA (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:402. 1953. Thecophyllum comatum Mez & Werckle, Bull. Herb. Boiss. II. 4:871. 1904. Costa Rica.

197. V. ANTILLANA Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Guzmania urbaniana Mez in DC. Mon. Phan. 9:920. 1896. Thecophyllum urbanianum Mez, Bull. Herb. Boiss. II. 3:131. 1903, not Vriesea urbaniana Harms, 1935. Lesser Antilles.

198. V. JOHNSTONII (Mez) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:402. 1953. Thecophyllum johnstonei Mez, Bull. Herb. Boiss. II. 4:872. 1904. Trinidad, Venezuela (Isla Margarita).

199. V. NOTATA Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum pittieri Mez, Bull. Herb. Boiss. II. 3:137. 1903, not Vriesea pittieri Mez, 1903. Costa Rica.

200. V. HYGROMETRICA (André) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:402. 1953.

Var. a. HYGROMETRICA. Caraguata hygrometrica André, Énum. Bromél. 6. Dec. 13, 1888; Rev. Hort. 60:566. Dec. 16, 1888.

Guzmania hygrometrica André ex Mez in DC. Mon. Phan. 9:919. 1896. Thecophyllum hygrometricum Mez, Bull. Herb. Boiss. II. 3:131. 1903. Colombia.

Var. b. ANGUSTIFOLIA L. B. Smith, Phytologia 8:222. 1962. Costa Rica.

201. V. PAUPERA (Mez & Sodiro) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum pauperum Mez & Sodiro, Bull. Herb. Boiss. II. 4:876. 1904. Ecuador.

202. V. PICTA (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum pictum Mez & Werckle, Bull. Herb. Boiss. II. 4:874. 1904. Costa Rica.

203. V LINEATA (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:402. 1953. Thecophyllum lineatum Mez & Werckle, Bull. Herb. Boiss. II. 4:875. 1904. T. balanophorum var. subpictum Suesseng. Bot. Jahrb. 72:291. 1942 (?). Costa Rica.

204. V. IRAZUENSIS (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:402. 1953. Thecophyllum irazuense Mez & Werckle, Bull. Herb. Boiss. II. 3:138. 1903. Costa Rica.

205. V. ORORIENSIS (Mez) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Guzmania ororiensis Mez in DC. Mon. Phan. 9:917. 1896. Thecophyllum ororiense Mez, Bull. Herb. Boiss. II. 3:131. 1903. T. kupperi Suesseng. & Goeppinger, Bot. Jahrb. 72:292. 1942. Vriesea kupperi Sm. & Pitt. Journ. Wash. Acad. Sci. 43: 402. 1953. Costa Rica.

206. V. CAPITATA (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:402. 1953. Thecophyllum capitatum Mez & Werckle, Bull. Herb. Boiss. II. 4:873. 1904. Costa Rica.

207. V. ATTENUATA Sm. & Pitt. Journ. Wash. Acad. Sci. 43:401. 1953. Thecophyllum acuminatum L. B. Smith, Contr. Gray Herb. 117:30, pl. 2, figs. 28, 29. 1937, not Vriesea acuminata Mez & Werckle, 1904. Costa Rica.

208. V. STENOPHYLLA (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum stenophyllum Mez & Werckle, Bull. Herb. Boiss. II. 4:875. 1904. Costa Rica.

209. V. BALANOPHORA (Mez) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:402. 1953. Guzmania balanophora Mez in DC. Mon. Phan. 9:918. 1896. Thecophyllum balanophorum Mez, Bull. Herb. Boiss. II. 3: 131. 1903. Costa Rica.

210. V. VIRIDIS (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum viride Mez & Werckle, Bull. Herb. Boiss. II. 4:872. 1904. Costa Rica.

211. V. HAINESIORUM L. B. Smith, Phytologia 8:498, pl. 1, fig. 7-10. 1963. Costa Rica.

212. V. WILLIAMSII L. B. Smith, Phytologia 6:193, pl. 1, figs. 1, 2. 1958. Costa Rica.

213. V. STANDLEYI (L. B. Smith) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum standleyi L. B. Smith, Contr. Gray Herb. 117:30, pl. 2, figs. 30, 31. 1937. Costa Rica.

214. V. SINTENISII (Baker) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Caraguata sintenisii Baker, Handb. Bromel. 145. 1889. Guzmania sintenisii Mez in DC. Mon. Phan. 9:920. 1896. Thecophyllum sintenisii Mez, Bull. Herb. Boiss. II. 3:131. 1903.

Puerto Rico.

215. V. SINGULIFLORA (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum singuliflorum Mez & Werckle, Bull. Herb. Boiss. II. 4:870. 1904. Costa Rica.

216. V. VITTATA (Mez & Werckle) Sm. & Pitt. Journ. Wash. Acad. Sci. 43:403. 1953. Thecophyllum vittatum Mez & Werckle, Bull. Herb. Boiss. II. 4:871. 1904. Costa Rica.

217. V. MALZINEI E. Morr. Belg. Hort. 24:313, pl. 14. 1874. Tillandsia malzinei Baker, Rep. Kew Gard. 1878:59. 1879. Pl. VI, fig. 1: Leaf x 1/4; fig. 2: Spike x 1/4. Mexico.

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218. V. EXTENSA L. B. Smith, Arquiv. Bot. Estado S. Paulo n. ser. 1:116, pl. 120. 1943. Vriesea regina sensu Wittm. Gartenfl. 40:160, figs. 46, 47. 1891. Brazil.

219. V. ALTA (Baker) E. Morr. ex Mez in DC. Mon. Phan. 9:617. 1896. Tillandsia alta Baker, Handb. Bromel. 226. 1889. Pl. I, fig. 23: Flower and bract x 1/5. Panama, Jamaica (?).

220. V. GENICULATA (Wawra) Wawra, It. Max. 156, pl. 25 (except the serrate leaves). 1866. Platystachys geniculata Wawra, Oesterr. Bot. Zeitschr. 12:345. 1862. Vriesea gigantea sensu Lem. Ill. Hort. 14:pl. 516. 1867, not as to description. V. glaziouana Lem. Ill. Hort. 14, Misc.:43, fig. 2. 1867. V. gigantea sensu Regel, Gartenfl. 16:385. 1867. V. regina sensu Gard. Chron. n. ser. 3:234, fig. 41. 1875. V. regina var. glaziouana Wawra, Oesterr. Bot. Zeitschr. 30:218. 1880. V. gigantea sensu Carr. Rev. Hort. 57:387. 1885 (?). Tillandsia regina sensu Baker, Journ. Bot. 26:139. 1888, in part. Vriesea vasta Mez in Mart. Fl. Bras. 3, pt. 3:572. 1894. Pl. I, fig. 24: Spike x 1/4. Brazil.

221. V. REGINA (Vell.) Beer, Bromel. 97. 1857. Tillandsia regina Vell. Fl. Flum. 136. 1825; Icon. 3:pl. 142. 1835. T. blokii Hemsl. Bot. Mag. 134:pl. 8192. 1908. Alcantarea regina Harms, Engl. & Prantl, Pflanzenfam. ed. 2, 15a:126. 1930. Vriesea blokii Mez, Engl. Pflanzenreich IV. 32:405. 1935. Pl. II, fig. 1: Section of spike x 1/4. Brazil.

222. V. BRASILIANA L. B. Sm ith, Arquiv. Bot. Estado S. Paulo n. ser. 1:115, pl. 119. 1943. Vriesea regina Mez in Mart. Fl. Bras. 3, pt. 3:569. 1894, in part. Pl. II, fig. 2: Apex of spike x 1/4. Brazil.

223. V. GIBBA L. B. Smith, Contr. U. S. Nat. Herb. 29:524, fig. 80. 1954. Jamaica.

224. V. IMPERIALIS Carr. Rev. Hort. 60:58. 1888. Vriesea gigantea sensu Lem. Ill. Hort. 14:sub pl. 516. 1867, as to description, not as to plate, nor Gaud., also as to Misc.:43, fig. 1. V. glaziouana Carr. Rev. Hort. 53:50, fig. 15, pl. 1881, not Lem. 1867. V. hillegeeriana hort. ex Ant. Phyto-Icon. 15. 1884, nomen Tillandsia regina sensu Baker, Handb. Bromel. 227. 1889, in part. Alcantarea imperialis Harms, Engl. & Prantl, Pflanzenfam. ed. 2. 15a:126. 1930. Pl. V, fig. 4: Leaf-apex x 1/4; fig. 5: Branch x 1/4. Brazil.

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APPENDIX

Additions, doubtful and excluded taxa, named hybrids:

NOTE: Unless otherwise indicated, information about hybrids is from Mez, Engl. Pflanzenreich IV. 32:406-410. 1935. BSB = Bromeliad Society Bulletin. G = A. B. Graf, Exotica ed. 3. 1963. R = W. Richter, Zimmerpflanzen von heute und morgen: Bromeliaceen 1962. Sources are followed in capitalization of names of hybrids and in the use of specific names of parents. Correct specific names can be found in the index above.

Vriesea aeris-incola Mez in Mart. Fl. Bras. 3, pt. 3:555. 1894 = TILLANDSIA AERIS-INCOLA (Mez) Mez.

x Africain C. Chevalier = V. LUBBERSII x MEPHISTO, BSB 1:21.

x Alberti André, Rev. Hort. 41:300, pl. 1899 = INCURVATA x (PSITTACINA x CARINATA).

albescens Alv. Silveira, Fl. Montium 2:pl. 131, fig. 2. 1931, nomen, apparently an error for his V. glauca.

albo-nitens Index Kew. Suppl. 1:458. 1906 (error) = VITIS ALBO-NITENS hort.

aloifolia (Hook.) Beer, Bromel. 95. 1857 = TILLANDSIA FLEXUOSA Sw.

anceps Lem. Fl. Serres 5:sub pl. 432. 1849 = TILLANDSIA ANCEPS Lodd.

x Andreana hort. Duval, Rev. Hort. 66:135. 1894 = PSITTACINA x LONGIBRACTEATA.

atro-purpurea Alv. Silveira, Fl. Montium 2:Add. 3, pl. 131, fig. 1. 1931. Identity not resolved.

x aurantiaca Opoix, Rev. Hort. 71:583. 1889 = (x REX) x (x POELMANII).

x aurora hort. Liége, Gartenfl. 42:340. 1893 = (CARINATA x PSITTACINA) x ENSIFORMIS.

x aurora major hort. Liége ex Wittm. Gartenfl. 42:340. 1893 = PSITTACINA x ENSIFORMIS.

x Belgica C. Chevalier, BSB 1:21. Identity?

x bijou hort. Duval, Rev. Hort. 65:213. 1893 - parents?

billbergia Lem. Ill. Hort. 16, Misc.:91. 1869 = TILLANDSIA VIRIDIFLORA (Beer) Baker?

x Boetscheria, BSB 4:58 - parents unknown.

botteri hort. ex Regel, Gartenfl. 33:293. 1884 = TILLANDSIA TRICOLOR Schlecht. & Cham.

x brachystachys major hort. Liége, Gartenfl. 42:339. 1893 = (CARINATA x BARILLETII) x CARINATA.

x brachystachys splendens hort. Duval, Rev. Hort. 64:551. 1892 = CARINATA x PSITTACINA var. RUBROBRACTEATA.

bracteosa Beer, Bromel. 263. 1857, nomen = TILLANDSIA CIRCINNATA Schlecht.

caespitosa E. Morr. ex Baker, Handb. Bromel. 213. 1889 = TILLANDSIA MULTICAULIS Steud.

x candelabrum, BSB 4:55 - parents unknown.

x Cappei hort. Duval, Rev. Hort. 66:285. 1894 = ?

x cardinalis hort. Duval, Rev. Hort. 62:358. 1890 = CARINATA x PSITTACINA var. RUBROBRACTEATA.

carinata var. wawra, BSB 5:43, nomen = ?

x Chantrieri Chantrier, R 279 = ? Leaves dark-banded.

x citrina hort. Opoix, Rev. Hort. 77:127. 1905 = ?

x Closoniana hort. Liége, Gartenfl. 42:431. 1893 = BARILLETII x (CARINATA x PSITTACINA).

x Closoniana brachystachys major, BSB 2:41 = (x MORRENIANA) x BARILLETII.

x Croix d'Honneur C. Chevalier, BSB 1:21 = ? Branched. Bracts lax.

decipiens F. Mueller, Gartenfl. 42:737. 1893 = ? Description inadequate.

x Devansayana hort. Duval, Rev. Hort. 65:202. 1903 = CARINATA x PSITTACINA var. RUBROBRACTEATA.

x Docteur Lebel hort. Duval, Rev. Hort. 70:539. 1898 = CONFERTA x (x REX).

x Donneai hort. Makoy ex Witte, Hybr. Brom. 8. 1894 = BARILLETII x GUTTATA.

x Duchartrei hort. Duval, Rev. Hort. 66:135. 1894 = ((CARINATA x PSITTACINA) x BARILLETII) x SPLENDIDA.

x Ducretii hort. Duval, Rev. Hort. 68:251. 1896 = ?

x Duvalii, BSB 1:21 = error for V. duvaliana E. Morr.?

x Duvalii major hort. Duval, Rev. Hort. 66:135. 1894 = DUVALIANA x (x FULGIDA).

x elegans hort. Duval, Journ. Soc. Nat. Hort. France 1892:706 = (BARILLETII x (CARINATA x PSITTACINA)) x DUVALIANA.

x elegans E. Morr. Rev. Hort. 64:551. 1892 = (BARILLETII x (CARINATA x PSITTACINA)) x (x FULGIDA).

x Elmiriana hort. Duval, Rev. Hort. 69:307. 1897 = ?

x erecta, BSB 8:50 = ?

x eros hort. Duval, Rev. Hort. 69:140. 1897 = CORALLINA var. ROSEA x ((CARINATA x PSITTACINA) x BARILLETII).

erythrodactylon var. striata Seidel, G 1734, nomen. Leaves pale-striped.

x esperanza hort. Duval, Rev. Hort. 69:140. 1897 = (x KITTELIANA) x SAUNDERSII.

Espirito Santo, G 1735 = ?

x Favorite , R 279 = ENSIFORMIS x ? Inflorescence simple. Floral bracts keeled.

x fenestralis var. mortfontanensis Chantrier, BSB 13:99 = FENESTRALIS x TESSELLATA.

x Flaming Sword, BSB 10:39 = SPLENDENS var. MAJOR x SPLENDENS var. LONGIBRACTEATA.

x Flamme Richter, BSB 10:39; R 280, 282 (B), 304 = (x VIGIERI) x BARILLETII.

x flammea hort. Duval, Rev. Hort. 74:27. 1902 = (x VANGEERTII) x JONGHEI

x Flammendes Schwert Richter, BSB 10:39; R 280 = SPLENDENS var. MAJOR x SPLENDENS var. LONGIBRACTEATA.

X fulgida hort. Duval, Ill. Hort. 60:87, pl. 67. 1888 =

ROSTRUM-AQUILAE x DUVALIANA.
x fulgida hort. Makoy, Witte, Hybr. Brom. 8. 1894 = INCURVATA x (x MORRENIANA).
x furcata hort. Devansaye, Rev. Hort. 69:163. 1897 = PHILIPPOCOBURGII x ENSIFORMIS.
x gemma hort. Duval, Gartenfl. 42:340. 1893 = (BARILLETII x (CARINATA x PSITTACINA)) x (DUVALIANA x INCURVATA).
x Gerbe de feu C. Chevalier, BSB 1:21 = ? Tall scape. Branched inflorescence. Red bracts.
x Gigant Richter, BSB 10:39; R 280 = (x POELMANII) x (VRIESEA SP. x PSITTACINA) x (x VERSAILLENSIS).
x ginoti Chantrier, BSB 13:99 = FENESTRALIS x ENCHOLIRION ROSEUM.
glauca Alv. Silveira, Fl. Montium 2:Add. 3. 1931. Description inadequate for classification.
glaucophylla Hook. Bot. Mag. 74:pl.4415. 1848 = TILLANDSIA FASCICULATA Sw.
glaucophylla hort. ex Mez, Engl. Pflanzenreich IV. 32:209. 1935 = HECHTIA TILLANDSIOIDES (André) L. B. Smith.
x gloriosa hort. Duval, Rev. Hort. 66:135. 1894 = BARILLETII x INCURVATA.
x Gnom Richter, BSB 10:39; R 280 = CORCOVADENSIS x (x POELMANII).
x gracilis hort. Liége, Witte Hybr. Brom. 8. 1894 = AMETHYSTINA x PSITTACINA.
x grandis Maron, Rev. Hort. 60:580. 1888 = ?
x griesseniana hort. Rev. Hort. 70:231. 1898 = ?
x griessensii hort. Duval, op. cit. 246 = the above.
x "Heinrich Schmidt" Mez in DC. Mon. Phan. 9:571: 1896 = (DUVALIANA x ROSTRUM-AQUILAE) x PSITTACINA.
HELICONIOIDES (105):
Var. b. POLYSTICHA L. B. Smith, Phytologia 8:222. Costa Rica.
x Henrici hort. Duval, Rev. Hort. 66:239. 1894 = ?
x "Henri Ducret" hort. Duval, Rev. Hort. 70:231. 1898 = ?
hieroglyphica "marginata", G 1735, nomen. Leaves pale-banded.
HIEROGLYPHICA (146): V. hieroglyphica var. zebrina Ruschi, Bull. Mus. Nation. Hist. Nat. II. 26:547, fig. 1954.
x hoelscheriana, R 270 = ? Inflorescence simple, lax, decurved.
x illustris Richter, R 280 = (x FLAMMENDES SCHWERT) x SPLENDENS.
imbricata (Vell.) Beer, Bromel. 94. 1857 = ? Based on Tillandsia imbricata Vell., but almost certainly a Vriesea. Not collected again so far as known.
x imperialis hort. Duval, Rev. Hort. 73:53. 1901 = (x MIRABILIS) x (x REX).
x insignis hort. Leiden, Gartenfl. 41:1, pl.1362. 1892 = BARILLETII x SPLENDENS.
x "Inspektor Kolb" Mez in DC. Mon. Phan. 9:571. 1896 = PSITTACINA var. RUBROBRACTEATA x (ROSTRUM-AQUILAE x DUVALIANA).
x "Inspektor Perring" Mez in DC. Mon. Phan.9:567. 1896 = BARILLETII x GUTTATA.

x intermedia hort. Liége, Gartenfl. 42:340. 1893 = BARILLETII x FENESTRALIS.

x Kienastii hort. ex Focke, Pflanzenmischl. 530. 1881 = CARINATA x PSITTACINA.

x Kitteliana Wittm. Gartenfl. 39:326, fig. 62, 63. 1890 = BARILLETII x SAUNDERSII.

x Komet Richter, BSB 10:39; R 280 = CORCOVADENSIS x (x SCEPTRE D'OR).

x Kramero-fulgida hort. Duval, Journ. Soc. Nat. Hort. France 1893:501 = PSITTACINA var. RUBROBRACTEATA x (ROSTRUM-AQUILAE x DUVALIANA).

legrelleana hort., BSB 15:46. = AECHMEA RECURVATA (Kl.) L. B. Smith.

x leodiensis hort. Liége ex Wittm. Gartenfl. 42:340. 1893 = BARILLETII x (CARINATA x PSITTACINA).

x Leonii hort. Duval, Rev. Hort. 74:27. 1902 = (x REX) x (x MIRABILIS).

x Leopoldi Witte, Gartenfl. 40:476. 1891 = the following.

x Leopoldiana Wittm. Gartenfl. 42:340. 1893; 54:281, pl. 1539. 1905 = SPLENDENS x MALZINEI.

lindenii Lem. Ill. Hort. 16:pl. 610. 1869 = TILLANDSIA CYANEA Linden ex K. Koch.

luschnathii Mez in Mart. Fl. Bras. 3, pt. 3:555, pl. 103. 1894 = TILLANDSIA SPICULOSA Griseb.

x luxemburgensis Opoix, Rev. Hort. 77:127. 1905 = ?

macropetala hort. Rev. Hort. 69:336. 1897 = TILLANDSIA VIRIDIFLORA (Beer) Baker.

maculata (R. & P.) Beer, Bromel. 98. 1857 = TILLANDSIA MACULATA R. & P.

x "Madame Susanne de Smet" hort. Gartenfl. 58:200. 1909 = (x MIRABILIS x (x VANGEERTII).

x magnifica hort. Makoy, Rev. Hort. Belg. 14:186. 1888 = VRIESEA SPLENDENS x GUZMANIA ZAHNII = GUZVRIESEA MAGNIFICA M. B. Foster, BSB 13:85.

x Magnisiana Kittel & Wittm. Gartenfl. 38:343, fig. 1889 = BARILLETII x FENESTRALIS.

x Magnusiana Ind. Kew. suppl. 1:458. 1906 = the above.

x majestica hort. Duval, Rev. Hort. 77:127. 1905 = ?

x Marechaliana hort. Makoy ex Witte, Hybr. Bromel. 9. 1894 = INCURVATA x (x MORRENIANA).

x Mariae André, Journ. Soc. Nat. Hort. France 1889:577; Rev. Hort. 61:300, pl. 1889 = CARINATA x BARILLETII.

x Marie (error) = the above.

x "memoria Moensi" hort. Rigouts, Rev. Hort. 69:307. 1897 = ?

x menelik hort. Liége, BSB 1:21 = ?

x mephisto hort., BSB 1:21 = ?

x minima hort. Duval ex Witte, Hybr. Bromel. 9. 1894 = (x MORRENIANA) x DUVALIANA.

x mirabilis hort. Duval, Rev. Hort. 74:27. 1902 = VRIESEA SPLENDENS x GUZMANIA ZAHNII = GUZVRIESEA MAGNIFICA M. B. Foster.

x Moensiana hort. Makoy, Rev. Hort. 70:246. 1898 = ?

x Morreniana, cf. species 49 above.

x morreno-barilletiana hort. Duval, Ill. Hort. 36:103, pl. 91. 1889 = (x MORRENIANA) x BARILLETII.

x morreno-barilletii hort., BSB 2:40 = the above.

musaica Cogn. & March. in Dallière, Pl. Ornament. 2:39. 1874 = GUZMANIA MUSAICA (Linden & André) Mez.

x nigricans hort. Duval, Rev. Hort. 77:254. 1905 = ROSTRUM-AQUILAE x ENSIFORMIS.

x obliqua, cf. species 53 above.

x Papa Chevalier C. Chevalier, BSB 1:21 = (x MEPHISTO) x PASTUCHOFFIANA.

x perfecta hort., BSB 4:38; R 272, 280 = ? Branched. Spikes dense. Floral bracts red.

x Petersiana Wittm. Gartenfl. 44:456, fig. 92. 1895 = BARILLETII x GUTTATA.

x Pleurvicii hort. Duval, Rev. Hort. vol. 76: p. ? 1894 = ?

x Poelmanii hort. Duval, Rev. Hort. 69:307. 1897 =(x GLORIOSA) x (x VANGEERTII).

x Poelmanii superba hort. Gartenfl. 58:200. 1909 = the above.

x Polonia C. Chevalier, BSB 1:21; 15:69 (pl.), 70 = ?

x Pommerescheana Wittm. Gartenfl. 42:129, pl. 1388. 1893 = SPLENDENS x (x MORRENIANA).

x "President Krueger" hort. Duval, Rev. Hort. 73:54. 1901 = (x REX) x PLATYNEMA.

x President O. Lamarche C. Chevalier, BSB 2:41 = INCURVATA x BARILLETII.

x Prince Charles C. Chevalier, BSB 1:21 = ? Branched. Salmon-pink bracts.

x Prince Leopold C. Chevalier, BSB 1:21 = ? Branched. Bracts salmon-pink washed with yellow.

x procera bicolor Dutrie, Bull. Hort. 117. 1 June 1947; BSB 11:62 = (x KITTELIANA) x (x BRACHYSTACHYS MAJOR) ?

x psittacina hybrida Richter, BSB 10:38; R 280 = PSITTACINA x ?

x psittacina picta hort. Liége ex Witte, Hybr. Brom. 10. 1894 = (x MORRENIANA) x BARILLETII.

x psittacina rubropunctata BSB 1:21 = error for var. RUBRO-BRACTEATA probably.

PSITTACINA (47): Vriesea psittacina var. exilis Neum Ann. Soc. Hort. Paris pl. 1852.

x psittacino-fulgida hort. Duval, Journ. Soc. Nat. Hort. France 1893:30 = (DUVALIANA x ROSTRUM-AQUILAE) x PSITTACINA.

pulverulento-lineata Carr. Rev. Hort. 60:89, fig. 1888 (sterile) = VRIESEA subgenus ALCANTAREA sp.?

purpurascens hort. Bull, Gard. Chron. 1893, 1:413 = NIDULARIUM INNOCENTII Lem.?

x Quintusiana hort. Makoy, Tijdschr. Tuinb. 1900:305, pl. 5; Rev. Hort. Belg. 66:285. 1894 = ?

ramosa Beer, Bromel. 265. 1857, nomen = TILLANDSIA UTRICULATA.

x retroflexa cf. species 54 above.

x rex hort. Duval, Rev. Hort. Belg. 1894:217, pl.; Rev. Hort. 79:570, pl. 1907 = (BARILLETII x (X MORRENIANA)) x (CARINATA x PSITTACINA var. RUBROBRACTEATA).

x rex candelabra Chantrier, BSB 1:33 = (x REX) x ?
x rex major hort. Duval, Rev. Hort. 67:582. 1895 = (x REX).
x rex rubis hort. Duval, Rev. Hort. 70:231. 1898 = (x REX).
x rex superba hort. Duval, loc. cit. = (x REX).
x "Ritter v. Fernsee" Mez in DC. Mon. Phan. 9:572. 1896 = CARINATA x PARAIBICA.
x Roehr's favorite BSB 4:99 = ?
roezlii hort. Linden ex Baker, Handb. Bromel. 207. 1889, nomen = TILLANDSIA ROEZLII E. Morr.
x roseo-lineata hort. Makoy, Rev. Hort. 66:306. 1894 = ?
x rubra Richter, BSB 10:39; R 304 = ?
x St. Joseph, BSB 4:9 = ?
sanctae-crucis S. Moore, Trans. Linn. Soc. II. 4:491. 1895 = TILLANDSIA PARAENSIS Mez.
x Sanderiana Wittm. Gartenfl. 46:377. 1897 = BARILLETII x (PSITTACINA x CARINATA).
x "sceptre d'or" hort. Gartenfl. 58:200. 1909 = SAUNDERSII x (x GLORIOSA).
x sceptrum hort. (not Mez), Rev. Hort. 70:246. 1898 = above.
schlechtendalii Wittm. and var. alba Wittm. Bot. Jahrb. 11:69. 1889 = TILLANDSIA ANCEPS Lodd.
setacea Hook. Bot. Mag. 60:pl. 3275. 1833 = TILLANDSIA FASCICULATA Sw. var. VENOSISPICA Mez = T. COMPRESSA Bert. ex R. & S.
siebertiana hort. Journ. Soc. Nat. Hort. France 1899:665 = TILLANDSIA LEIBOLDIANA Schlecht.?
x souvenir de Jos. Mawet C. Chevalier, BSB 1:24 = ?
x sphinx hort. Duval ex Witte, Hybr. Brom. 10. 1894 = FENESTRALIS x LONGIBRACTEATA.
x splendens illustris hort., BSB 11:7 = SPLENDENS x (x FLAMMENDES SCHWERT).
x splendens var. cayenne Lecoufle, BSB 13:105 (leaves only)= ?
splendens var. major hort., BSB 11:7; R 269, 277 = horticultural selected clone.
SPLENDENS (37):
Var. c. STRIATIFOLIA M. B. Foster, Bromel. Soc. Bull. 5:92. 1955. Venezuela.
x splendida hort. Duval, Rev. Hort. 64:551. 1892 = CARINATA x (x FULGIDA).
streptophylla E. Morr. Cat. Brom. Liége, 17. 1873 = TILLANDSIA STREPTOPHYLLA Scheidw.
x superba hort. Duval, Rev. Hort. 71:169, 511. 1899 = (x KITTELIANAL x (x REX).
tenuifolia Beer, Bromel. 96. 1857 = TILLANDSIA FLEXUOSA Sw. as to description and T. TENUIFOLIA L. as to basonym.
x tenuis hort. Edinburgh ex Mez, Engl. Pflanzenreich IV. 32: 409. 1935 = PER-PSITTACINA x CARINATA.
tessellata Sanderae hort. Sander, Rev. Hort. 65:202. 1893 = GIGANTEA.
tessellata variegata hort. Gartenfl. 42:305. 1893 = GIGANTEA.
tessellata var. roseo-picta hort., R 277. Leaves with large rose-red spots.

tricolor hort. ex Baker, Handb. Bromel. 109. 1889 = PITCAIRNIA MAIDIFOLIA (C. Morr.) Dcne.
tricolor Alv. Silveira, Fl. Montium 2:pl. 130. 1931 = error for AECHMEA TRICOLOR Alv. Silveira, op. cit. Add. 2.
x trifurcata hort. Duval, Rev. Hort. 65:213. 1893 = ?
utriculata Regel, Ind. Sem. Hort. Petrop. 1869:34 = TILLANDSIA UTRICULATA L.
x Van Ackeri hort., BSB 11:61, 63 = (x POELMANII) x ?
x Van Geertii hort. Duval, Rev. Hort. 68:251. 1896; BSB 11:61 = INCURVATA x ?
x versaillensis Truff. Ill. Hort. 36:73, pl. 87. 1889 = DUVALIANA x CARINATA.
x Vigeri hort. Duval, Rev. Hort. 70:395. 1898 = RODIGASIANA x (x REX).
x viminalis erecta hort., BSB 1:22 = (x POELMANII) x ?
x viminalis-rex hort., BSB 11:62 = the above.
viridis E. Morr. ex Baker, Handb. Bromel. 204. 1889, nomen = TILLANDSIA SPICULOSA Griseb.
x Wallonia hort. Liége, BSB 1:21 = ?
x Weyringeriana Wittm. Gartenfl. 39:7, fig. 1. 1890 = BARILLETII x SCALARIS.
x Wioteana hort. Liége ex Wittm. Gartenfl. 42:340. 1893 = BARILLETII x PSITTACINA.
Wirteana hort. ex Mez, Engl. Pflanzenreich IV. 32:667. 1935 = error for the above.
x Witteana hort. Duval, Rev. Hort. 66:435. 1894 = DUVALIANA x (x MORRENIANA).
x "Witte senior" Mez In DC. Mon. Phan. 9:572. 1896 = CARINATA x ENSIFORMIS.
x Wittmackiana Kittel, Gartenfl. 37:553, pl. 1283. 1888 = BARILLETII x (x MORRENIANA).
XX Vrieslandsia Prof. Bouillene C. Chevalier, BSB 1:23 = VRIESEA (x SOUVENIR DE JOS. MAWET) x TILLANDSIA CAESPITOSA Schlecht. & Cham. (= T. MULTICAULIS).

NOTE: The above compilation is doubtless far from complete and should be greatly enlarged when the Bromeliad Society's list of hybrids is published. However, it is hoped that it will prove useful as a general reference until then.

MISCELLANEOUS NOTES

TROPICAL AMERICA

BROMELIA REDOUTEI (Baker) L. B. Smith, comb. nov.
Bromelia karatas var. caulescens Redouté, Lil. 8:pl. 457. 1816.
Karatas redoutei Baker, Handb. Bromel. 3. 1889.
Bromelia caulescens Kuntze, Rev. Gen. 3, pt. 2:302. 1898, nomen in synon.

BRAZIL (?): Hort. Redouté (Herb.? basis of Redouté, Lil. plate 457 in volume 8).

So far, no herbarium specimen of Redouté's plant has been

found, so the type must be the plate and description for the present. If it were to be placed with any known species, it would go with B. serra Griseb. rather than with B. balansae Mez as formerly. However, it differs from B. serra in its nearly naked scape and much larger floral bracts and flowers. Consequently it seems best to consider it one more of the many species described from cultivation and never recollected in the wild.

COSTA RICA, PANAMA

TILLANDSIA OERSTEDIANA L. B. Smith, sp. nov.

Tillandsia paniculata Cham. & Schlecht. var. costaricensis Mez in DC. Mon. Phan. 9:703. 1896.

Tillandsia rubra R. & P. var. costaricensis (Mez) Mez, Pflanzenreich 4, Fam. 32:458. 1935.

Tillandsia deppeana Steud. var. costaricensis (Mez) L. B. Smith, Phytologia 5:395. 1956.

A T. deppeana Steud., cui affinis, foliorum laminis bicoloribus subtus dense cinereo-lepidotis; spicis patentibus breviter stipitatis, floribus minoribus differt.

PLANT flowering 6-15 dm high. LEAVES rosulate, many, 4-8 dm long, bicolorous, covered beneath with persistent appressed cinereous scales; sheaths subelliptic, large; blades subligulate, attenuate, to 4 cm wide. SCAPE erect; scape-bracts erect, subfoliaceous, densely imbricate. INFLORESCENCE laxly bipinnate; primary bracts exceeding the sterile mostly bracteate bases of the branches, broadly ovate; spikes spreading, lance-oblong, acute, complanate, ca. 9 cm long (fertile) and 3 cm wide; floral bracts imbricate and concealing the rhachis at anthesis, 3 cm long, exceeding the sepals, coriaceous, even, glabrous, carinate; flowers subsessile. SEPALS lanceolate, acute, 25 mm long, carinate, the posterior very short-connate. Pl. VI, fig. 5: Leaf-apex x 1/4; fig. 6: Spike x 1/4; fig. 7: Posterior sepals x 1.

COSTA RICA: Lankester 1526 (GH); Echeverría 221 (GH). Oriri, Oersted s. n. (C, type). Cartago, Wercklé s. n. (GH); alt. 1200 m, 17 Dec. 1948, M. B. Foster 2695 (US).

PANAMA: Chiriquí: Boquete, alt. 1150 m, June 1938, Davidson 825 (F).

ECUADOR, PERU

TILLANDSIA LATIFOLIA Meyen, Reise 2:45. 1835; Obs. Bot. Itinera in Nov. Act. Nat. Cur. 19, Suppl. 1:437. 1843.

Tillandsia kunthiana Gaud. Atl. Voy. Bonite pl. 53. 1842; L. B. Smith, Phytologia 7:108. 1959.

In 1959, I adopted Tillandsia kunthiana Gaud. as the correct name for this species because I failed to discover the earliest publication of T. latifolia Meyen. I now return the species to T. latifolia along with var. major Mez and var. divaricata (Benth.) Mez.

All three varieties are typical of the arid coastal region, but var. divaricata is distinctly more northern than the others.

PERU

PITCAIRNIA PUNGENS H.B.K. var. FLAVA L. B. Smith, var. nov.

A var. PUNGENS petalis flavis differt.

PERU: Cuzco: Prov. Urubamba: Cliff above Inca road 1 km east of Machu Picchu, Valley of Río Urubamba, ca. 80 km WNW of Cuzco, alt. 2550-2800 m, 3 January 1963, H. H. & C. M. Iltis & D. & V. Ugent 1128 (US, type; WIS, isotype).

PUYA CORIACEA L. B. Smith, sp. nov.

A P. angulonis L. B. Smith, cui affinis, bracteis florigeris quam floribus longioribus sed reflexis, sepalis apiculatis differt.

PLANT flowering about 1 m high. LEAVES ca. 4 dm long; sheaths suborbicular, 55 mm wide, entire, lepidote beneath toward apex, elsewhere glabrous; blades very narrowly triangular, 25 mm wide, covered on both sides with appressed cinereous scales but more or less glabrous above with age and thus distinctly bicolorous, laxly serrate with brown mostly recurved 3 mm long spines. SCAPE erect, 15 mm in diameter, very finely white-stellate, becoming glabrous; scape-bracts erect, densely imbricate, the lower foliaceous, the upper broadly ovate with linear blades, nearly glabrous, pectinate-serrate. INFLORESCENCE simple, strobilate, cylindric, 2 dm long, 6 cm in diameter; floral bracts ovate, acuminate, pungent, 6 cm long, exceeding the flowers but recurved at anthesis, pectinate-serrate, coriaceous but distinctly nerved, nearly glabrous, sublustrous; pedicels obconic, 5 mm long, densely white-stellate. SEPALS lance-elliptic, broadly acute and apiculate, 21 mm long, coriaceous, coarsely and closely nerved, slightly white-stellate at base; petals about 4 cm long, bright green (! Hutchison), barely exceeding the stamens; strongly twisted after anthesis. Pl. VI, fig. 8: Floral bract and flower x 1/2; fig. 9: Sepal x 1.

PERU: La Libertad: Prov. Huamachuco: 40 km above Pullac crossing over Río Chuagon Valley between Río Marañon and Buldibuyo, alt. 3640 m, 7 Aug. 1964, P. C. Hutchison, J. K. Wright & R. M. Straw 6170 (US, type; UC isotype).

PUYA GLANDULOSA L. B. Smith, sp. nov.

A P. meziana Wittm. atque speciebus aliis generis inflorescentiae glandulis sessilibus differt.

PLANT known only from fragments, probably flowering over 2 m high. LEAVES over 12 dm long; blades very narrowly triangular, over 4 cm wide, obscurely lepidote between the nerves beneath, glabrous above, laxly serrate with broad castaneous antrorse 12 mm long spines. SCAPE unknown. INFLORESCENCE branching (! Hutchison); primary bracts unknown; branches cylindric, rather dense but some of the rhachis visible at anthesis, except for the petals subdensely vestite with minute pale sessile glands; floral bracts suberect at anthesis, linear-lanceolate, acuminate, thin-coriaceous when dry, entire; pedicels slender, to 12 mm long. SEPALS linear-lanceolate, obtuse, 37 mm long, ecarinate, thin;

petals ca. 7 cm long, exceeding the stamens, green (! Hutchison), naked, twisted together after anthesis. Pl. VI, fig. 10: Floral bract and flower x 1/2; fig. 11: Sepal x 1.

PERU: La Libertad: 11 km above Samne, alt. 2290 m, 5 Aug. 1964, P. C. Hutchison, J. K. Wright & R. M. Straw 6123 (US, type; UC isotype).

PUYA HUTCHISONII L. B. Smith, sp. nov.

P. rauhii in systema mea proxima sed scapi bracteis persistentibus haud nigris nec fragilis, floribus minoribus differt.

PLANT known only at the beginning of anthesis, ca. 1.5 m high. LEAVES over 6 dm long; blades very narrowly triangular, 4 cm wide, paler above, covered with pale appressed persistent scales on both sides, laxly serrate with spreading pale brown 5 mm long spines. SCAPE straight, 12 mm in diameter, densely and finely white-stellate, soon glabrous; scape-bracts erect, the lowest unknown, the others linear-lanceolate, the median serrate, the upper entire. INFLORESCENCE simple, cylindric, 4-5 dm long, rather lax at least toward base, except for the petals covered with a fine pale gray stellate tomentum; floral bracts suberect, narrowly triangular, acuminate, about equaling the sepals of the lowest flowers, elsewhere distinctly shorter, coriaceous; pedi cels slenderly obconic, 12 mm long. SEPALS linear-lanceolate, broadly acute and apiculate, 30 mm long, ecarinate, coriaceous; petals 5 cm long, about equaling the stamens, naked, metallic blue (! Hutchison). Pl. VI, fig. 12: Scape-bract x 1/2; fig. 13: Floral bract and flower x 1/2; fig. 14: Sepal x 1.

PERU: Ancash: 1/2 km above Chancos on the road to Vicos, alt. 2875 m, 14 March 1964, P. C. Hutchison & J. K. Wright 4380 (US, type; UC isotype).

PUYA ILTISIANA L. B. Smith, sp. nov.

In systema mea P. gummifera Mez & Sodiro atque P. asplundii L. B. Smith affinis, a priore bracteis florigeris homomorphis, floribus subsessilibus, a posteriore indumento albido, a ambobus sepalis parvis haud obovatis differt.

PLANT known only from fragments but probably less than 1 m high. LEAVES 3-4 dm long; sheaths suborbicular, castaneous and lustrous beneath becoming cinereous-lepidote at apex; blades very narrowly triangular, pungent, 12 mm wide, covered on both sides with appressed cinereous scales, laxly serrate with pale brown slender curved 5 mm long spines. SCAPE slender, densely and finely stellate-lepidote; scape-bracts much exceeding the internodes, the upper ones thin and drying stramineous but persistent, broadly triangular-ovate with a narrow serrulate blade, cinereous-tomentose. INFLORESCENCE sublaxly bipinnate, slenderly cylindric, 3 dm long, densely and finely cinereous-tomentose; primary bracts like the upper scape-bracts, much shorter than the spikes but their blades sometimes slightly exceeding them; spikes divergent, sessile, densely few-flowered, the lateral to 4 cm long, the terminal 8 cm; floral bracts broadly ovate, acuminate, much exceeded by the sepals; flowers sessile. SEPALS narrowly

lanceolate, acute, 14 mm long. CAPSULES subglobose, 12 mm long. Pl. VI, fig. 15: Spike x 1/2; fig. 16: Sepal x 1.

PERU: Apurimac: Prov. Aymaraes: Talus slope with bromeliads, valley of Río Challhuanca, ca. 18 km north of Challhuanca on road to Abancay at km 104 from Abancay, alt. 2700 m, 17 Dec. 1962, H. H. & C. Iltis & D. & V. Ugent 613 (US, type: WIS, isotype).

PUYA MACROPODA L. B. Smith, sp. nov.

P. sanctae-martae L. B. Smith in systema mea proxima sed pedicellis fructiferis plus minusve applanatis multo majoribus, sepalis valde angustioribus acuminatisque differt.

PLANT flowering ca. 2 m high. LEAVES Unknown but presumably spinose-serrate judging by the scape-bracts. SCAPE straight, slightly compressed, to 3 cm wide, finely white-stellate, glabrous with age; scape-bracts erect, much exceeding the internodes but not completely covering the scape, the lowest unknown, the others elliptic, acute, pungent, subchartaceous, finely white-stellate, densely spinose-serrate near apex. INFLORESCENCE simple, cylindric, nearly 1 m long, subdensely many-flowered, very finely white-stellate, soon glabrous; axis stout; floral bracts soon reflexed, lance-oblong, acute, entire, to 6 cm or longer, exceeding the pedicels, subchartaceous; pedicels slender, ca. 2 cm long at anthesis, becoming stouter, flattened, and 4 cm long in fruit. SEPALS linear-lanceolate, acuminate, ecarinate, 28 mm long at anthesis, 40 mm in fruit, subcoriaceous, nerved when dry; petals 5 cm long, yellow-green (! Hutchison), twisted together after anthesis. CAPSULE very broadly ellipsoid, 25 mm long. Pl. VI, fig. 17: Floral bract and old flower x 1/2; fig. 18: Fruiting sepal x 1.

PERU: Amazonas: Prov. Chachapoyas: Dry slopes overlooking the Río Utcubamba, 11 km west of Chachapoyas on the road to Caclic, alt. 1930 m, 26 June 1964, P. C. Hutchison & J. K. Wright 5855 (US, type; UC, USM, isotypes).

PUYA PONDEROSA L. B. Smith, sp. nov.

A P. herzogii Wittm., cui affinis, bracteis primariis florigerisque ovatis ex sicco stramineis vel pallide brunneis, sepalis minoribus cum indumento persistente differt.

PLANT flowering somewhat over 1 m high. LEAVES 6 dm or longer; blades very narrowly triangular, rigid, 25 mm wide, bicolorous, covered beneath with whitish appressed scales, glabrous above, laxly serrate with curved castaneous spines 5 mm long. SCAPE straight, 6 cm in diameter at base, soon glabrous; scape-bracts early deciduous but evidently densely imbricate judging by the very short internodes, the lowest subfoliaceous, the others unknown. INFLORESCENCE densely cylindric, 40 cm long, 10 cm in diameter, bipinnate but appearing simple, at first whitish-tomentose except the petals; primary bracts ovate, acute, about twice as long as the axillary spikes and with their apical half reflexed and soon glabrous, entire; spikes subglobose, densely few-flowered; floral bracts ovate, acute, about equaling the sepals, thin; pedicels stoutly obconic, 10 mm long. SEPALS lanceolate,

acute, 25 mm long, thin-coriaceous, drying stramineous, their tomentum persistent; petals ca. 4 cm long, exceeding the stamens. Pl. VI, fig. 19: Floral bract and flower x 1/2; fig. 20: Sepal x 1.

PERU: Ayacucho: Prov. Lucanas: Rocky slopes in arid basaltic Tola heath (Lepidophyllum quadrangulare), descent to Lucanas (Puquio) from Paso de Kondor sencha, on Nazca-Puquio Road, "Pampa Galera", alt. 3800 m, 13 Dec. 1962, H. H. & C. Iltis & D. & V. Ugent 445 (US, type; WIS, isotype).

PUYA WRIGHTII L. B. Smith, sp. nov.

P. rauhii L. B. Smith in systema mea proxima sed foliorum laminis utrinque dense lepidotis, scapi bracteis persistentibus longe caudatis haud nigrescentibus differt.

PLANT flowering over 2 m high. LEAVES to 13 dm long; sheaths suborbicular, glabrous toward base; blades very narrowly triangular, caudate-acuminate, 30-45 mm wide, concolorous, densely cinereous-lepidote on both sides, laxly serrate with antrorse brown spines 4 mm long. SCAPE straight, 15 mm in diameter, finely white-stellate, becoming glabrous; scape-bracts erect, exceeding the internodes, the lowest subfoliaceous, the median triangular-ovate, caudate with long linear sparsely serrate blades, the upper lanceolate, bladeless, serrate, densely and finely white-stellate. INFLORESCENCE simple, cylindric, 5 dm long, subdensely many-flowered with the rhachis clearly visible, densely white-stellate except the petals; floral bracts mostly spreading at anthesis, narrowly triangular-ovate, acuminate, to 6 cm long, the lowest about equaling the sepals, the upper much shorter, subcoriaceous, all but the lowest entire; pedicels slender, to 22 mm long. SEPALS narrowly lanceolate, broadly acute and apiculate, 32 mm long, subcoriaceous, strongly nerved when dry, ecarinate; petals with narrow lateral folds, nocturnal, very pale green (! Hutchison), twisted together after anthesis. CAPSULE subglobose, 2 cm long; seeds reticulate, the wing circumferential, cuneate. Pl. VI, fig. 21: Floral bract and flower x 1/2; fig. 22: Sepal x 1.

PERU: Cajamarca: Prov. Jaen: Cliff faces and steep rocky slopes, a little north of Pucará, alt. 1000 m, 12 Jan. 1964, P. C. Hutchison & J. K. Wright 3560 (US, type; UC, isotype).

TILLANDSIA HUTCHISONII L. B. Smith, sp. nov.

A T. marantoidea Rusby, cui verisimiliter affinis, omnibus partibus valde majoribus, inflorescentia ramosissima, spicarum rhachi geniculata differt.

PLANT flowering 1.5-2 m high (! Hutchison & Wright). LEAVES over 8 dm long; sheaths broadly ovate, densely punctulate-lepidote, dark castaneous beneath; blades ligulate, broadly subacute and apiculate, flat, 9 cm wide, minutely and obscurely lepidote beneath, glabrous above. SCAPE unknown. INFLORESCENCE amply 3-4-pinnate, glabrous, red except the petals; primary bracts broadly ovate, acuminate, 10-11 cm long, exceeding the bracteate sterile base of the branch; branches to 47 cm long, the axis

flattened, flexuous; secondary bracts scarcely larger than the floral bracts, exceeding the bracteate sterile bases of the axillary simple or 2-3-parted branches; spikes laxly 3-6-flowered, 4-7 cm long; rhachis geniculate, slender; floral bracts subspreading, elliptic, subacute, mostly slightly exceeded by the sepals, thin, strongly and closely nerved with a wide membranaceous margin, ecarinate; flowers subsessile, sometimes somewhat secund. SEPALS narrowly elliptic, obtuse, 17 mm long, unequally short-connate, thin, strongly nerved, ecarinate; petals naked, linear, 4 cm long, white, slightly exceeding the stamens. Pl. VI, fig. 23: Secondary branch x 1/2; fig. 24: Sepals x 1.

PERU: Amazonas: Prov. Bongara: On road to Rioja, 5 km north of the north end of Laguna Pomacocha, alt. 2000 m, 8 Oct. 1964, P. C. Hutchison & J. K. Wright 6801 (US, type; UC, isotype).

TILLANDSIA PIURENSIS L. B. Smith, sp. nov.

T. rubella Baker atque T. barbeyana affinis, a priore foliorum laminis haud ligulatis sed anguste triangularibus, bracteis florigeris laevibus, a posteriore floribus multo majoribus, a ambobus sepalis posticis inter sese connatis differt.

PLANT flowering over 6 dm high. LEAVES probably rosulate, to 45 cm long, obscurely punctulate-lepidote throughout; sheaths broadly elliptic, scarcely distinct, ca. 10 cm long, dark castaneous above, concolorous with the blades beneath; blades narrowly triangular, long-attenuate, 5 cm wide, pale green striated or marmorated dark purple-black (! Hutchison). SCAPE slightly curved but probably ascending, 6 mm in diameter, glabrous; scape-bracts suberect, subfoliaceous, their bases exceeding the internodes but not altogether covering them. INFLORESCENCE bipinnate, 24 cm long, dense at apex, lax below; primary bracts ovate, the lowest slightly shorter than the reduced axillary spikes but with their blades exceeding them, the upper bladeless and less than half as long as the spikes; spikes subsessile with 1-2 sterile bracts at base, the upper spikes lanceolate, acute, strongly complanate, 7-8 cm long, 2 cm wide (fruting), 8-9-flowered; floral bracts imbricate and concealing the rhachis, elliptic, acute, carinate and slightly incurved toward apex, 25 mm long, equaling the sepals, coriaceous, even, glabrous; flowers subsessile. SEPALS linear-oblanceolate, broadly acute, 24 mm long, thin, nerved, obscurely lepidote, the anterior free, the posterior connate for 6 mm, carinate. Pl. VI, fig. 25: Spike x 1/2; fig. 26: Posterior sepals x 1.

PERU: Piura: Prov. Huancabamba: Cliff faces, Río Huancabamba gorge 3-4 km below Huancabamba on the road to Sondor, alt. 2000 m, 16 Sept. 1964, P. C. Hutchison & J. K. Wright 6616 (UC, type).

TILLANDSIA (TILLANDSIA) PLATYPHYLLA Mez, Fedde Rep. Nov. Spec. 3: 37. 1906; L. B. Smith in Macbride Fl. Peru, Bot.Series Field Mus. Nat. Hist. 13:558. 1936, emend. 1966.

Inflorescentia ample tripinnatim paniculata, ramis spicas ad 8 ferentibus; petalis nudis; staminibus exsertis.

PERU: Cajamarca: Prov. Hualgayoc: Between San Pablo and San

Miguel, alt. 1700 m, 2 May 1904, Weberbauer 3888 (B, type; F phot. 11521). Prov. Jaen: Km 113 between Acapulco and Pucará on the Río Huancabamba, alt. 1000 m, 10 Jan. 1964, P. C. Hutchison & J. K. Wright 3516 (UC, US).

TILLANDSIA (PSEUDO-CATOPSIS) TETRANTHA R. & P. var. RAMOSIOR L. B. Smith, var. nov.

A var. tetrantha et varietatibus alteris inflorescentia tripinnata differt. A T. bakeri L. B. Smith bracteis primariis, florigeris floribusque majoribus, et a T. tripinnata (Baker) Mez spicarum rhachibus vix angulatis nec geniculatis differt.

PERU: Amazonas: Prov. Chachapoyas: Cerros Calla Calla, 18 km above Leimebamba, km 410 on road to Balsas, alt. 3100 m, 14 June 1964, P. C. Hutchison & J. K. Wright 5669 (US, type; UC, isotype)

NOTE: In its small primary bracts and large floral bracts Tillandsia tetrantha var. ramosior is closer to var. aurantiaca than to the typical variety.

BOLIVIA

PUYA UGENTIANA L. B. Smith, sp. nov.

In systema mea P. oxyantha Mez affinis, sed foliorum laminis supra dense lepidotis, inflorescentiae indumento persistente, floribus longe pedicellatis differt.

PLANT flowering over 2 m high. LEAVES over 1 m long; blades very narrowly triangular, rigid, 6 cm wide, obscurely lepidote between the nerves beneath, covered with appressed cinereous scales above, laxly serrate with castaneous antrorse spines 3 mm long. SCAPE straight, 5 cm in diameter at base, soon glabrous; scape-bracts persistent, exceeding the internodes but covering very little of the scape, the lowest subfoliaceous, the others broadly triangular with short serrate blades. INFLORESCENCE lax, bipinnate, over 1 m long, finely and densely whitish-stellate including the petals; primary bracts like the upper scape-bracts, much shorter than the axillary branches; spikes subspreading, strobilate, subsessile, the central ones to 17 cm long; floral bracts lanceolate, acute, nearly 5 cm long and about equaling the sepals; pedicels slenderly subcylindric, 15 mm long. SEPALS lanceolate, narrowly obtuse, 30 mm long; petals linear, stellate at least toward base. CAPSULES subglobose, 2 cm long. Pl. VII, fig. 1: Floral bract and flower x 1/2; fig. 2: Sepal x 1.

BOLIVIA: Chuquisaca: Prov. Oropeza: Steep rocky slope with Puyas and Mentzelia, 29 km ENE of Sucre on the Sucre-Aiquile Road (15 km ENE of Sucre by map distance),alt. ca. 1950 m, 13 April 1963, D. Ugent 4998 (US, type; WIS, isotype).

BRAZIL

AECHMEA CALATHEOIDES L. B. Smith, sp. nov.

A Ae. basi-lateralis (Lem.) L. B. Smith, cui valde affinis, sepalorum partibus liberis serrulatis, pedicellis longis differt.

PLANT caulescent; rhizome 15 mm in diameter. LEAVES few,

rosulate, 7 dm long, densely white-lepidote beneath, glabrous above; sheaths narrow, inconspicuous, entire; petioles 3 dm long, 1 cm wide, channeled, laxly serrate with flat spreading to antrorse 2 mm long teeth; blades linear-lanceolate, attenuate, 3 dm long, 55 mm wide, flat, laxly serrate. SCAPES several, borne below the rosette, horizontal, short; scape-bracts imbricate, elliptic, sparsely serrulate. INFLORESCENCES simple, strobilate, ellipsoid, 5 cm long; floral bracts polystichous, elliptic, apiculate, 25 mm long, thin, densely serrulate, red, densely pale-lepidote; pedicels slender, 5 mm long. SEPALS 22 mm long, connate for 15 mm, the free apices broadly spatulate, apiculate, serrulate. FRUIT globose, 14 mm in diameter. Pl. VII, fig. 3: Inflorescence x 1/2; fig. 4: Fruit x 1.

BRAZIL: Amapá: In shade, forest swamp, wet clay soil, immediately east of Colonia Agricola de Oiapoque, 3° 43' N, 51° 55' W, about 4 km north of mouth of Cricú River, 14 Aug. 1960, H. S. Irwin, W. A. Egler & L. Y. Th. Westra 47527 (NY, type).

AECHMEA FARINOSA (Regel) L. B. Smith, comb. nov.
AECHMEA FARINOSA var. FARINOSA
Lamprococcus farinosus Regel, Ind. Sem. Hort. Petrop. 1868:79. 1869.
Aechmea farinosa hort. Makoy ex Regel,loc. cit., nomen in synon.
Aechmea conglomerata var. farinosa (Regel) Baker, Handb. Bromel. 53. 1889; L. B. Smith, Bromel. Brazil, Smithsonian Misc. Coll. 126:204. 1955.
Aechmea glomerata var. farinosa (Regel) Mez in Mart. Fl. Bras. 3, pt. 3:316. 1892.

The basonym for Aechmea farinosa was antedated by that for Ae. glomerata Mez, but the later name was invalid because of Hooker's earlier use of it for another species. Then the substitute name, Ae. conglomerata, was later than the basonym of Ae. farinosa, so that it becomes necessary to make new combinations for all three varieties of the species.

AECHMEA FARINOSA (Regel) L. B. Smith var. CONGLOMERATA (Baker) L. B. Smith, comb. nov.
Lamprococcus glomeratus Beer, Bromel. 105. 1857.
Aechmea conglomerata hort. ex Baker, Handb. Bromel. 52. 1889; L. B. Smith, Bromel. Brazil, Smithsonian Misc. Coll. 126:204. 1955.
Aechmea glomerata (Beer) Mez in Mart. Fl. Bras. 3, pt. 3:315. 1892, not Hook. 1867.

AECHMEA FARINOSA (Regel) L. B. Smith var. DISCOLOR (Beer ex Baker) L. B. Smith, comb. nov.
Lamprococcus glomeratus var. discolor Beer, Bromel. 105. 1857, nomen.
Aechmea glomerata discolor hort. ex Beer, Bromel. 105. 1857, nomen.
Aechmea conglomerata var. discolor Beer ex Baker, Handb. Bromel. 53. 1889; L. B. Smith, Bromel. Brazil, Smithsonian Misc.

Coll. 126:205. 1955.

BILLBERGIA BRACHYSIPHON L. B. Smith var. PARAËNSIS L. B. Smith, var. nov.

A var. brachysiphon sepalis inaequalibus, apice latioribus differt. Pl. VII, fig. 5: Sepals x 1.

BRAZIL: Pará: Epiphytic, Breves, 25 May 1958, P. B. Cavalcante 483 (MG 23049, type).

BROMELIA CACHIMBENSIS L. B. Smith, sp. nov.

A B. balansae Mez, cui affinis, ramis infimis basi longe sterilibus, pedicellis gracilibus longioribusque, sepalis majoribus differt.

PLANT known only from the flowering shoot, over 4 dm high. SCAPE ca. 1 cm in diameter at apex, covered with tomentellous pale brownish indument. INFLORESCENCE subcylindric, dense, 35 cm long, 12 cm in diameter, the axes and ovaries densely tomentellous like the scape; primary bracts suborbicular, covering the branches except for the petals, serrate; branches dense, broadly ellipsoid, the lowest with slender sterile naked bases to 3 cm long; floral bracts oblong, broadly acute, exceeding the ovary, obscurely serrulate, carinate, soon glabrous; pedicels distinct, slender, to 12 mm long in fruit. SEPALS oblong, cucullate, conduplicate, 26 mm long, free, entire, soon glabrous; petals 33 mm long, elliptic; stamens connate at base for 10 mm; ovary subcylindric, 18 mm long, epigynous tube narrowly funnelform, 5 mm high. FRUIT broadly ellipsoid, 25 mm long. Pl. VII, fig. 6: Flower x 1.

BRAZIL: Pará: Cachimbo, 9° 20' S, 54° 53' W, 9 Nov. 1955, W. Bockermann 252 (IAN 111630, type).

BROMELIA OLIVEIRAE L. B. Smith, sp. nov.

Habitu foliisque B. agavifoliae Brongn. ex Houllet valde simulans sed pedicellis fructiferis elongatis, sepalis fere duplo majoribus differt.

PLANT known only from fragments. LEAF (only one) with linear blade over 2 m long, maximally 50 mm wide, contracted gradually below to 25 mm, covered beneath with fine appressed whitish scales, glabrous above, laxly serrate with distally antrorse basally retrorse black curved 5 mm long spines. SCAPE stout, to 10 cm long, densely lanate with fine pale brown scales; scape-bracts densely imbricate, elliptic, ample, thin, serrulate, minutely and inconspicuously lepidote, nearly white when dry. INFLORESCENCE subglobose, ca. 15 cm in diameter, dense, many-flowered; axes covered with finely divided pale brown scales; floral bracts linear, broadly acute, conduplicate, thin, very obscurely serrulate, glabrous or nearly so, whitish; fruiting pedicels slender, to 12 mm long. SEPALS like the floral bracts but entire, 25-30 mm long, glabrous; petals imperfectly known, linear, glabrous; stamens with filaments connate for 6 mm; ovary with narrowly funnelform epigynous tube 5 mm long. FRUIT ellipsoid, at least 3 cm long (young). Pl. VII, fig. 7: Flower x 1.

BRAZIL: Pará: Upland rain forest, km 147 of the Belém - Brasília Highway, 17 Feb. 1960, E. Oliveira 518 (IAN 105255, type).

DYCKIA IRMGARDIAE L. B. Smith, sp. nov.

Habitu D. reitzii L. B. Smith valde similis sed sepalis posterioribus alato-carinatis, filamentis ultra tubum petaleo-stamineum liberis differt.

PLANT flowering to 1 m high. LEAVES very numerous in a spreading rosette; blades very narrowly triangular, to 56 cm long, 18 mm wide, subrigid, covered beneath with closely appressed pale cinereous scales, soon glabrous above, laxly serrate with black antrorse curved 2 mm long spines. SCAPE erect, 5 mm in diameter, densely ferruginous-lanate; scape-bracts densely imbricate, narrowly triangular from a broadly ovate base, ferruginous-lanate. INFLORESCENCE simple, densely many-flowered, ca. 3 dm long, densely ferruginous-lanate; floral bracts like the upper scape-bracts, mostly exceeding the flowers; pedicels stout, compressed, 5 mm long. SEPALS ovate, acuminate, 10 mm long, the posterior ones alate-carinate; petals 15 mm long, the blade subrhombic; stamens included, filaments free above the junction with the petals; stigmas subsessile. Pl. VII,fig. 8: Floral bract and flower x 1; fig. 9: Sepal x 1.

BRAZIL: Rio Grande do Sul: Ledge by top of cliff, Caracol, 20 Nov. 1964, L. B. & R. C. Smith, I. Schultz & Oyara s. n. (US, type).

NOTE: The species is named in honor of our hostess, Dra. Irmgard Schultz of the Universidade do Rio Grande do Sul.

DYCKIA MARITIMA Baker, Handb. Bromel. 136. 1889.
Dyckia tomentosa Mez in DC. Mon. Phan. 9:515. 1896.
Prionophyllum maritimum (Baker) Mez, op. cit. 542.

BRAZIL: Rio Grande do Sul: Tweedie s. n. (K, type; GH photo). Sellow Bromel 73 (P, type of Dyckia tomentosa Mez; GH photo 3003) Tôrres, Reitz 4427 (HBR); Smith & Reitz 5824 (R, RB, US).

NOTE: Dyckia maritima Baker is abundant and conspicuous on the rocky headlands at Tôrres and both Tweedie and Sellow must have passed very close to this place. It is more than likely that Tôrres is the type locality for both species.

DYCKIA PARAENSIS L. B. Smith, sp. nov.

Habitu D. duckei L. B. Smith valde similis sed bracteis florigeris quam pedicellis robustis longioribus, filamentis ultra tubum petaleo-stamineum breviter connatis differt.

PLANT flowering 7 dm high. LEAVES many in a subbulbous rosette, 5 dm long; sheaths ample, ca. 4 cm long; blades recurved-spreading, very narrowly triangular, rigid, 25-30 mm wide, covered beneath with closely appressed cinereous scales, soon glabrous above, very laxly serrate with black subspreading 1.5 mm long spines. SCAPE erect, very slender, soon glabrous; scape-bracts remote, very small, acuminate from a broadly ovate base, entire. INFLORESCENCE simple, very lax, over 2 dm long, glabrous; floral bracts like the upper scape-bracts, to 5 mm long;

pedicels spreading, rather stout, 3 mm long. SEPALS elliptic-oblong, broadly rounded, 6 mm long, ecarinate, rather thin; petals 10 mm long, about equaling the stamens, the blades very broadly rounded, carinate; stamens with filaments short-connate above the junction with the petals; stigmas subsessile. Pl. VII, fig. 10: Floral bract and flower x 1; fig. 11: Sepal x 1; fig. 12: Pistil x 1.

BRAZIL: Pará: On sandstone ledges, Santa Cruz dos Martírios, campos of Andorinhas, region of Araguáia, alt. 600 m, 15 June 1953, R. L. Fróes 30030 (IAN 79853, type).

DYCKIA PUMILA L. B. Smith, sp. nov.

A D. duckei L. B. Smith, cui affinis, pedicellis brevibus crasse obconicis differt.

PLANT nearly stemless, flowering 18 cm high. LEAVES many in a spreading rosette, 13 cm long; sheaths suborbicular, 25 mm wide, brown, glabrous, laxly and minutely serrate near apex; blades linear-triangular, pungent, 7 mm wide, thick, laxly serrate with spreading slender brown spines 2 mm long, covered with white scales but glabrous above with age. SCAPE erect, slender, very finely white-lepidote, soon glabrous; scape-bracts small, much shorter than the internodes, ovate, attenuate, obscurely serrulate. INFLORESCENCE simple, lax, few-flowered, 2-5 cm long, very sparsely white-stellate-lepidote; floral bracts like the scape-bracts but entire, to 6 mm long; pedicels broadly obconic, 2 mm long. SEPALS broadly elliptic, rounded and apiculate, 6 mm long, the posterior ones carinate; petals very broadly subacute, 10 mm long, orange; stamens barely exserted; filaments free above the short common tube with the petals; stigma subsessile. CAPSULE subglobose, apiculate, 13 mm long, dark castaneous. Pl. VII, fig. 13: Inflorescence x 1.

BRAZIL: Goiás: Steep rocky talus, at base of cliff face, ca. 50 km south of Caiaponia on road to Jataí, Serra de Caiapó, 17° 12' S, 51° 47' W, alt. 800-1000 m, 25 Oct. 1964, H. S. Irwin & T. R. Soderstrom 7365 (US, type;NY).

DYCKIA SILVAE L. B. Smith, sp. nov.

D. tuberosa (Vell.) Beer in systema mea affinis sed petalorum laminis magnis valde patentibus, stylo nullo differt.

PLANT acaulescent, flowering 66 cm high. LEAVES many in a spreading rosette, 25 cm long; sheaths suborbicular, 3 cm wide, brown, nearly glabrous; blades linear-triangular, rigid, 2 cm wide, thick, laxly serrate with spreading slender brown spines 3 mm long, covered with white appressed scales but glabrous above with age. SCAPE erect, slender, very sparsely white-lepidote, soon glabrous; scape-bracts small but nearly all exceeding the internodes, the lowest with foliaceous blades, the highest broadly ovate, attenuate, slightly shorter than the internodes. INFLORESCENCE simple, subdensely many-flowered, 18 cm long, very sparsely white-lepidote; floral bracts like the highest scape-bracts, serrulate, the lowest about equaling the sepals; pedicels subcylindric, thick, 3 mm long, strongly constricted at base and

appearing articulate. SEPALS ovate, obtuse with a wide thin margin, 6-7 mm long; petals yellow, to 17 mm long, the blade broadly rounded, 6 mm wide, strongly carinate and curved spreading; stamens much shorter than the petals, filaments free above the short common tube with the petals; stigma sessile. Pl. VII, fig. 14: Floral bract and flower x 1; fig. 15: Sepal x 1.

BRAZIL: Pará: On rocks in campo, region of Garotire, Mun. Altamira, 8 Aug. 1962, N. T. Silva 784 (IAN 114554, type).

ENCHOLIRIUM GLAZIOVII Mez in Mart. Fl. Bras. 3, pt. 3:505. 1894, emend. L. B. Smith 1966.

Encholirium subsecundum sensu L. B. Smith, Smithsonian Misc. Coll. 126:43. 1955, quoad L. B. Smith 7036, non Mez 1896.

Foliis ad 9 dm longis; vaginis reniformibus, ad 9 cm latis, atro-castaneis, apice dense brunneo-lepidotis, alibi glabris; laminis anguste triangularibus, 5 cm latis, basi spinis latis planis 10 mm longis subdense armatis, alibi laxiore armatis; scapo erecto, 25 mm diametro; scapi bracteis erectis, internodia superantibus, infimis subfoliaceis late vaginatisque, supremis late ellipticis, apice attenuatis, valde serrulatis. Pl. VII, fig. 16: Floral bract and flower x 1.

BRAZIL: Minas Gerais: Without further data, Glaziou 19918 (B, type, F photo 11456). Chapeu do Sol, Serra do Cipó, 19° 40' s, 43° 57' W, alt. 1000 m, 29 April 1952, L. B. Smith & Mus. R. 7036 (R, US).

NOTE: It could well be that L. B. Smith 7036 is topotypic. Glaziou collected in company with Schwacke and on occasion also appropriated the collections of others as his own (Sleumer, Bot. Jahrb. 76:153. 1954), and Schwacke is known to have collected on the Serra do Cipó. L. B. Smith 7036 agrees closely with such parts as are represented in the rather incomplete type.

ENCHOLIRIUM MAGALHAESII L. B. Smith, sp. nov.

A E. subsecundo (Baker) Mez, cui affinis, inflorescentia floribusque valde minoribus differt.

PLANT flowering only about 8 dm high. LEAVES unknown but basal scape-bracts presumably more or less foliaceous. SCAPE erect, slender, glaucous; scape-bracts all longer than the internodes and with inconspicuous sheaths, the lower ones with linear-triangular blades over 2 dm long, laxly serrate and covered beneath with whitish appressed scales, the upper scape-bracts much reduced, narrowly lanceolate, entire. INFLORESCENCE simple, 10-11 cm long, 25-30 mm in diameter, interrupted at base, otherwise dense, glabrous; floral bracts like the upper scape-bracts, exceeding the lowest flowers; pedicels 3 mm long. SEPALS asymmetric, suboblong, subtruncate, 7 mm long; petals narrow, barely exceeding the sepals; stamens exserted; ovary narrowly pyramidal, 12 mm long. CAPSULE ovoid, dark castaneous; seed orbicular-falcate. Pl. VII, fig. 17: Floral bract and flower x 1.

BRAZIL: Minas Gerais: Campo, slopes of Serra de Diamantina, July 1960, M. Magalhães 18056 (IAN 107941, type).

GRAVISIA RODRIGUESIANA L. B. Smith, sp. nov.

Ab omnibus speciebus generis adhuc cognitis inflorescentia e spicis elongatis dense digitata differt.

PLANT flowering over 6 dm high. LEAVES 14 dm long; sheaths broadly elliptic, distinct, 20 cm long, dark castaneous, minutely appressed-lepidote; blades very narrowly triangular, 4 cm wide, coriaceous, soon glabrous, sparsely serrate with slender spreading dark 5 mm long spines. SCAPE straight, stout, appressed-lepidote; scape-bracts strict, large and very densely imbricate, drying dark castaneous, the lower subfoliaceous, the upper with short entire involute-subulate blades. INFLORESCENCE bipinnate, globose, densely digitate; primary bracts broadly ovate, mucronate, 35 mm long, even or slightly nerved at apex, red (! Rodrigues), drying to dark castaneous, obtusely carinate, punctulate-lepidote; spikes subcylindric, 10 cm long, 3 cm wide, densely many-flowered; floral bracts closely imbricate in about 5 ranks, broadly elliptic, rounded and mucronate, 30 mm long, equaling the sepals, mostly ecarinate, punctulate-lepidote, green (! Rodrigues), drying stramineous; flowers subsessile. SEPALS asymmetric, 19 mm long, short-connate; epigynous tube infundibuliform, 2 mm high; petals and stamens unknown. Pl. VII, fig. 18: Spike x 1/2; fig. 19: Sepal x 1.

BRAZIL: Amazonas: Mata de baixio, Bosque de Palmeiras, Reserva Florestal Ducke, Manaus, W. Rodrigues 5399 (US, type; INPA 14068, isotype).

ORTHOPHYTUM LEPROSUM (Mez) Mez in DC. Mon. Phan. 9:117. 1896; L. B. Smith, Brom. Brazil, Smithsonian Misc. Coll. 126:80. 1955.

Prantleia leprosa Mez in Mart. Fl. Bras. 3, pt. 3:259, pl. 58, fig. 2. 1891.

BRAZIL: Minas Gerais: Cachoeira do Inferno, Rio Jequetinhonha, Sept. 1820, Pohl 5229 (W, type). Very common in dense masses, caatinga on rock outcrop, between Itaobim and Joaima, ca. 16° 35' S, 41° 15' W, Nov. 1959, M. Magalhães 17598 (IAN 106716).

NOTE: The Magalhães collection must be from very near the type locality and, except for a loss of indument due to wear, it appears to be a close match. The type locality has been given erroneously as in Goiás when actually it is in northeastern Minas Gerais near the remainder of the genus which is limited to northeastern Brazil. The other supposedly western locality for the genus was eliminated when Mulford Foster realized that there had been a label mixture in O. foliosum and that his 1079 of Mato Grosso should have been 881 of Espírito Santo.

PITCAIRNIA IRWINIANA L. B. Smith, sp. nov.

Petalis ignotis, P. ensifolia Mez vel P. karwinskyana Beer in systema mea affinis sed sepalis omnibus late alato-carinatis differt.

PLANT nearly stemless, flowering about 3 dm high. LEAVES many in a fasciculate rosette, the larger ones over 2 dm long; sheaths broadly ovate, 2 cm long, imperfectly known because of

fire damage; blades dimorphic, some reduced to subulate dark spinose-serrate spines, others foliaceous, linear, subulate-attenuate, scarcely if at all narrowed at base, 10 mm wide, covered with white appressed scales but becoming glabrous above, deciduous along a straight transverse line, entire except the short persistent spinose-serrate base. SCAPE erect, 5 mm in diameter, white-flocculose; scape-bracts all exceeding the internodes, the lower foliaceous with deciduous blades, the upper much smaller and ovate. INFLORESCENCE simple, dense, 5-6 cm long; floral bracts like the upper scape-bracts, 2 cm long, exceeding the slender 13 mm long pedicels. SEPALS oblong-elliptic, acute, 15 mm long, all broadly alate-carinate; petals and stamens unknown; ovary about 2/3 superior. Pl. VII, fig. 20: Old flower (type) x 1; fig 21: Young inflorescence (paratype) x 1; fig. 22: Same, sepal x 1.

BRAZIL: Goiás: Rooted among boulders, mesa summit, near escarpment, ca. 50 km south of Caiaponia on road to Jataí, Serra do Caiapó, 17° 12' S, 51° 47' W, alt. 800-1000 m, 25 Oct. 1964, H. S. Irwin & T. R. Soderstrom 7347 (US, type; NY). Same, base of escarpment, 26 Oct. 1964, Irwin & Soderstrom 7370 (NY, US).

PITCAIRNIA LIMAE L. B. Smith, Phytologia 7:254, pl. 1, figs. 9, 10. 1960, emend. 1966.

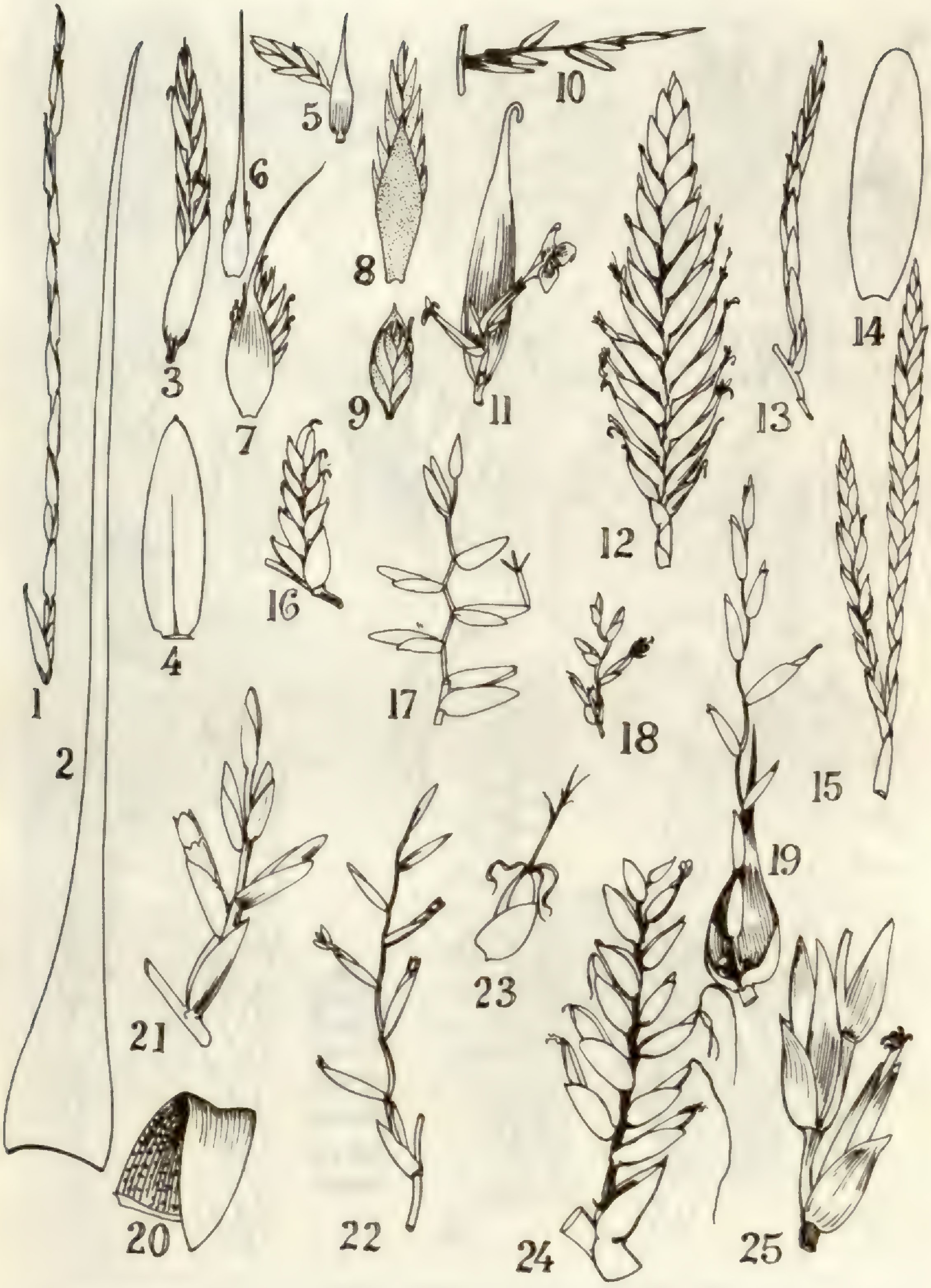
Florifera ad 75 cm alta; foliis multis, homomorphis; vaginis late ovatis, 3 cm longis, atro-castaneis; laminis persistentibus, linearibus, apice longe attenuatis, basi vix contractis, 18 mm latis, subtus densissime cinereo-lepidotis, supra mox glabris, basi laxe spinoso-serrulatis, alibi integris; petalis nudis vel basi ligula auctis.

BRAZIL: Ceará: Serra de Maranguape, cume da Rajada, 14 Sept. 1908, A. Ducke s. n. (MG 1661, topotype).

Plate I

Fig. 1: Vriesea rauhii. 2-4: V. olmosana. 5: V. didistichoides. 6: V. fragrans. 7: V. cylindrica. 8: V. harmsiana. 9: V. tillandsioides. 10: V. lubbersii. 11: V. drepanocarpa. 12: V. gravisiana. 13, 14: V. glutinosa. 15: V. chrysostachys. 16: V. schwackeana. 17: V. friburgensis. 18: V. rodigasiana. 19: V. altodaserrae. 20, 21: V. saundersii. 22: V. procera. 23: V. alta. 24: V. geniculata. 25: V. gigantea.

Plate I



(For explanation see preceding page)

Plate II

Fig. 1: Vriesea regina. 2: V. brasiliana. 3: V. erythrodactylon. 4: V. heliconioides. 5: V. barilletii. 6: V. incurvata. 7: V. inflata. 8: V. petropolitana. 9, 10: V. splendens. 11: V. carinata. 12: V. duvaliana. 13: V. paraibica. 14: V. gladioliflora. 15: V. ovandensis.

Plate III

Fig. 1, 2: Vriesea apiculata. 3: V. amethystina. 4: V. psittacina. 5: V. recurvata. 6: V. morreniana. 7: V. ensiformis. 8, 9: V. fenestralis.

Plate IV

Fig. 1: Vriesea jonghei. 2, 3: V. fosteriana. 4, 5: V. platynema. 6: V. bituminosa. 7, 8: V. pardalina 9, 10: V. guttata. 11: V. retroflexa. 12: V. simplex. 13, 14: V. scalaris. 15-17: V. tuerckheimii. 18: V. philippocoburgii. 19: V. ringens.

Plate V

Fig. 1: Vriesea itatiaiae. 2, 3: V. confusa. 4, 5: V. imperialis. 6, 7: V. hieroglyphica. 8: V. werckleana. 9: V. sanguinolenta. 10, 11: V. vanhyningii. 12: V. viridiflora. 13: V. marnier-lapostollei. 14, 15: V. broadwayi. 16, 17: V. racinae. 18, 19: V. splitgerberi. 20: V. capituligera.

Plate VI

Fig. 1, 2: Vriesea malzinei. 3, 4: V. flammea. 5-7. Tillandsia oerstediana. 8, 9: Puya coriacea. 10, 11: P. glandulosa. 12-14: P. hutchisonii. 15, 16: P. iltisiana. 17, 18: P. macropoda. 19, 20: P. ponderosa. 21, 22: P. wrightii. 23, 24: Tillandsia hutchisonii. 25, 26: T. piurensis.

Plate VII

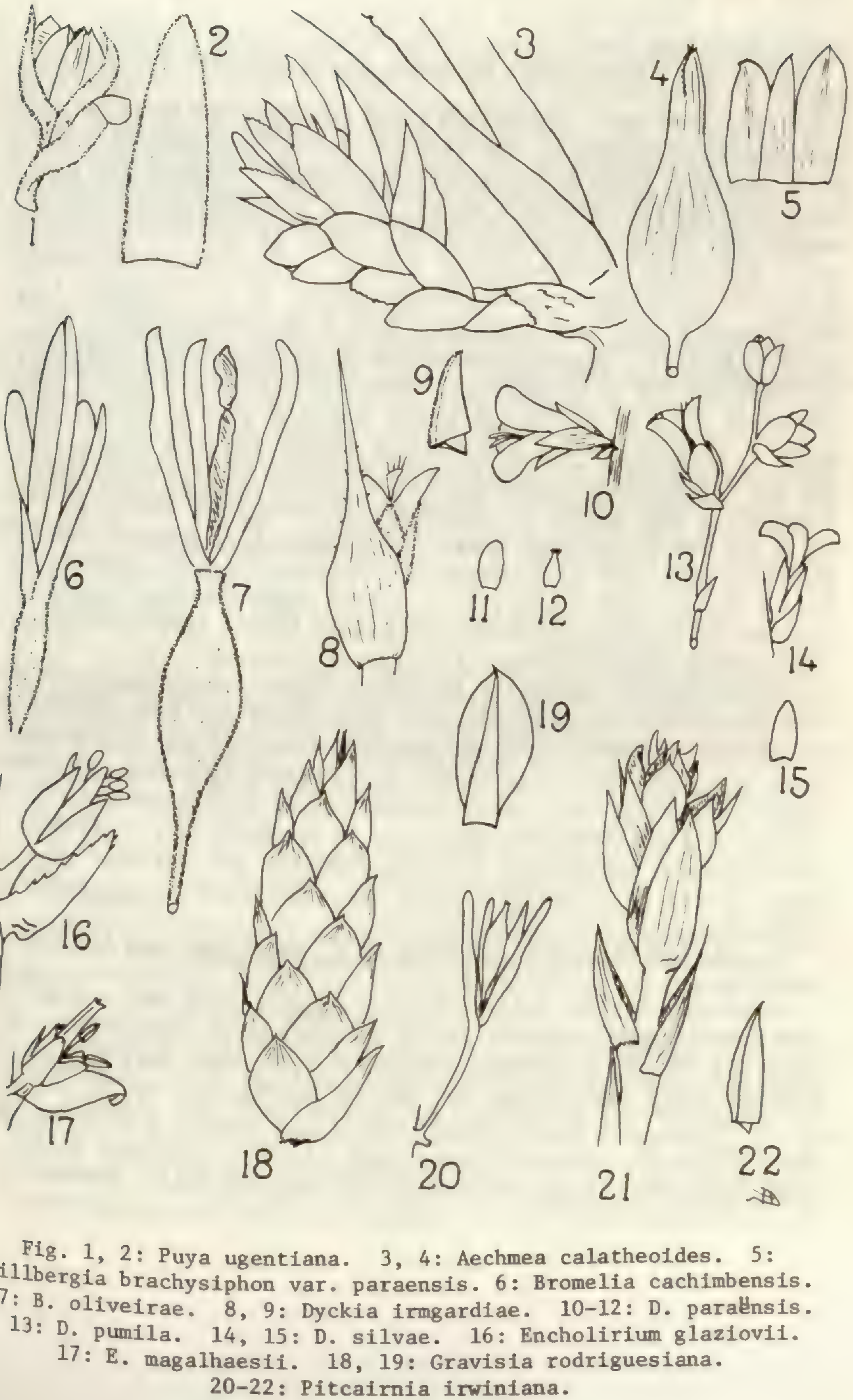


Fig. 1, 2: Puya ugentiana. 3, 4: Aechmea calatheoides. 5: Billbergia brachysiphon var. paraensis. 6: Bromelia cachimbensis. 7: B. oliveirae. 8, 9: Dyckia irmgardiae. 10-12: D. paraënsis. 13: D. pumila. 14, 15: D. silvae. 16: Encholirium glaziovii. 17: E. magalhaesii. 18, 19: Gravisia rodriguesiana. 20-22: Pitcairnia irwiniana.

MATERIALS TOWARD A MONOGRAPH OF THE GENUS LIPPIA. X

Harold N. Moldenke

LIPPIA UMBELLATA Cav.

Additional bibliography: Moldenke, Phytologia 13: 7 & 32—35. 1966.

On the other hand, the Hinton 12945 and S. S. White 5271, distributed as L. umbellata, are actually L. callicarpaefolia H.B.K.; P. C. Standley 20803 is L. cardiostegia Benth.; Heyde & Lux 4387 is L. controversa Moldenke; Holway 307 is L. costaricensis Moldenke; Edw. Palmer 479 [April to Nov. 1896] is the type collection of L. curtisiana Moldenke; Paray 3123 is L. durangensis Moldenke; Hurd 67 is L. gentryi Standl.; Balls B.5489, N. L. H. Krauss 858, and Rzedowski 6906 are L. hypoleia Briq.; H. S. Gentry 5662 and Mexia 1636 are L. jaliscana Moldenke; H. Pittier 5387 and R. S. Williams 151 are L. oxyphyllaria (Donn. Sm.) Standl.; Arsène 5293, Breedlove 1572, D. S. Correll 14396, Galeotti 787, H. S. Gentry 2037, J. Gonzalez Ortega 5707, Hinton 11717, 12949, & 13614, Mexia 458 1/2 & 1354, Edw. Palmer 479 [Oct. 1894 — March 1895], Rose, Standley, & Rose 14798, J. Rzedowski 15630 & 19280, and C. L. Smith 218 are L. pringlei Briq.; Ghiesbreght 634, Heyde & Lux 4389, Türckheim 8441, and S. S. White 5271 (in part) are L. substrigosa Turcz.; DeLeon 1618 & 1629, H. S. Gentry 5353, and Edw. Palmer 1969 are L. tepicana Moldenke (the latter is the type collection); and Gaumer & sons 23627 bis is L. yucatana Greenm.

In the Harvard University herbarium the following specimens are also filed under L. umbellata, but have not as yet been checked by me: MEXICO: Guerrero: E. W. Nelson 2285 (G), 2319 (G). Hidalgo: H. E. Moore 2000 (G). Michoacán: E. W. Nelson 6951 (G). Morelos: Seler & Seler 4309 (G). State undetermined: Berlandier 1028 [Cordillera da Guchilapa] (G); Halbinger 53 [Balsas] (G). GUATEMALA: Huehuetenango: Skutch 1080 (A). EL SALVADOR: San Salvador: Calderón 14 (G); P. C. Standley 19395 (G). Sonsonate: P. C. Standley 22181 (G).

In all, 140 herbarium specimens of L. umbellata have been examined by me.

Citations: MEXICO: Colima: McVaugh & Koelz 1069 (Mi). Federal District: Bourgeau 968 (Br, S); J. N. Couch M.126 (Hi—14509); Lyonnet 457 (N); H. N. Moldenke 19853 (B, F, Mg, Mr, No); Moldenke & Moldenke 19853 (Bm, Bs, Es, Fy, Hk, Hw, Le, Lg, Lm, Mm, N, Ok, Ot, Rs, S, Sm, Sm, Ss, Ss, Z); Paray 2188 (Ip); Russell & Souviron 184 (Gg—237840, N). Guerrero: Langlassé 744 (Cb). Jalisco: R. Mc Vaugh 10070 (Mi), 11746 (Mi), 13425 (Mi), 13935 (Mi). México: L. N.

Goodding 2178 (Ca—130059, En—6170, I, N, S); Hinton 393 (N, N), 2099 (N, N), 2574 (K), 2918 (N, N), 7237 (K, N), 11910 (La), 13550 (La); M. E. Jones 747 (Po—68896); Matuda 18690 (N), 25831 (Cb); Paray 1349 (Ip); Pringle 11089 (Fs, Gg—421282, I, I, Mi, S, Vt); Purpus 1694 (Ca—139739, N, Po—64347). Michoacán: Arsène s.n. [Morelia, 4-12-1910] (B, Mi, N); Hinton 11910 (Au, It, Mi, N, Rf, Ur), 12791 (Mi, N, N, Rf), 13550 (Au, It, Mi, N, Rf, Ur), 15706 (N, N, Rf), 15707 (La); King & Soderstrom 5161 (Ca); E. W. Nelson 6564 (N); Pringle 3948 (Br, C, Ca—25123, Io—38730, Me, Me, Me, Mi, Mx—15407, Ob—50730, Pa, Pl—22594, Po—63856, S, Vt). Morelos: Fröderström & Hultén 308 (S); E. Lyonnet 1239 (W—1746023), 2838 (W—1790981); Pringle 7714 (I, Vt), 9129 (La, Vt), 11090 (Cm, It, N); Rowntree 300 (Fs); W. Trelease 246 (Ur). Nayarit: Edw. Palmer s.n. [Tepic, Jan.—Feb. 1892] (Cp). Oaxaca: Galeotti 795j (N, V); C. L. Smith 225 (Vi). Puebla: C. C. Deam 135 (G), s.n. [Ixtaccihautl, Jan. 5, 1899] (Mi). Sinaloa: H. S. Gentry 7222 (Ak—21642, Ca—946106, Mi, N); Edw. Palmer 1199 (Cp, Cp). Vera Cruz: Balls 5489 (W—1793856). State undetermined: Haenke 1588 (N); Quarles van Ufford 105 (Ut); Sessé, Mociño, Castillo, & Maldonado 2123 (Q), 2203 (Q), 2218 (Q), 2219 (Q, Q).

LIPPIA VELUTINA Schau. in A. DC., Prodr. 11: 576. 1847.

Synonymy: Lippia mollis Mart. ex Moldenke, Suppl. List Invalid Names 6, in syn. 1941.

Bibliography: Schau. in A. DC., Prodr. 11: 576. 1847; Schau. in Mart., Fl. Bras. 9: 226. 1851; Bocq., Adansonia 3: 245. 1863; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 96. 1894; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 540. 1911; Moldenke, Suppl. List Invalid Names 6. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 38 & 96. 1942; Moldenke, Alph. List Invalid Names 31. 1942; Moldenke, Alph. List Cit. 2: 413 (1948), 3: 686, 693, 710, & 935 (1949), and 4: 1300. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 191. 1949; Moldenke, Phytologia 3: 305. 1950; Moldenke, Résumé 94, 314, & 463. 1959; Troncoso, Darwiniana 12: 260. 1961; Moldenke, Phytologia 12: 23, 47, 152, 170, 310, & 455. 1965.

Shrub, to 2 m. tall; branchlets subtetragonal, subpulverulent-glandular and appressed-tomentose; leaves decussate-opposite; petioles 6—8 mm. long; leaf-blades ovate-oblong or lanceolate, acute and not at all attenuate at the apex, very shortly apiculate at the tip, crenulate along the margins, acute at the base and contracted into the petiole, penninerved, flat, velutinous above, densely very short-tomentose with appressed hairs and canescent beneath, the lower ones on the branchlets 5—7.5 cm. long and 1.8—3 cm. wide, gradually decreasing in size upwards, the uppermost ones only 2.5 cm. long; secondaries 9—11, hardly impressed above, prominent beneath, the areoles not truly bullate; inflorescence subpulverulent-glandular and appressed-tomentose; pe-

duncles axillary, aggregate, flaccid, 8--12 mm. long, longer than the subtending petioles; heads tetraquetrous, subglobose, about 6 mm. in diameter, larger in fruit; bractlets subherbaceous, broadly ovate, acuminate at the apex, villous-ciliate, spreading, folded-recurved at the apex, shorter than the corolla-tube, connate below, canescent, in 4 series, the lower ones slightly larger; calyx short, ovate, unequally 4-dentate, hirtellous, ciliate; corolla hypocrateriform, yellowish, becoming greenish in drying, its tube 4 mm. long, slightly curvate, ventricose and pubescent below the mouth, the limb pubescent on the back, its lobes rounded, unequal, the lower slightly larger and subquadrate, retuse and mucronate at the apex, undulate along the margins; fruit closely invested by the persistent but not diphyllous calyx, ellipsoid, almost the size of a grain of millet (Panicum miliaceum L.), dark, shiny, usually only 1 seed developed and the other rudimentary.

This species was based by Schauer on a specimen collected in April by Antonio Luiz Patricio de Silva Manso [Herb. Martius 1024] at Morro do Ernesto, near Cujabá, Matto Grosso, Brazil, and on specimens collected by Johann Emanuel Pohl at São Isidro and at Corallingo, Goiás, Brazil, deposited in the Vienna, Munich, and DeCandolle herbaria. The first-mentioned of these is also the type collection of L. mollis and a specimen so labeled in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, originally inscribed "1098" on the label, was photographed by Macbride as his type photograph number 7861, as well as another of the same collection, labeled L. velutina, photographed by him as his type photograph number 24676.

Schauer (1847) places the species in his Section Goniostachyum and says "Proxime affinis L. Salviaefoliae, sed distincta statura validiora, foliis figura alienis, magis elongatis, utrinque acutis, haud rugosis, indumento brevissimo appresso neque laxo vestitis, ramealibus et subfloralibus majoribus." The flowers on Mendes Magalhães 4329 are described by the collector as "yellowish". Material has been misidentified and distributed in herbaria as L. origanoides H.B.K. On the other hand, the Glaziou 14157, distributed as L. velutina, is actually L. salviaefolia Cham.

In all, 7 herbarium specimens, including type material of both names involved, and 11 mounted photographs have been examined by me.

Citations: BRAZIL: Matto Grosso: Silva-Manso s.n. [Morro do Ernesto; Herb. Martius 1024; Macbride photos 7861 & 24676] (Br--cotype, Br--cotype, F--photo of cotype, Kr--photo of cotype, Kr--photo of cotype, M--cotype, N--photo of cotype, N--photo of cotype, N--photo of cotype, N--photo of cotype, Si--photo of cotype, W--photo of cotype, W--photo of cotype, Z--photo of cotype). Minas Geraes: A. P. Duarte 7580 [Herb. Brad. 27648] (N); Mendes Magalhães 4329 [Herb. Jard. Bot. Belo Horiz. 45152] (N), 19499 (N). State undetermined: Martius 1037 (M).

LIPPIA VERNONIOIDES Cham., Linnaea 7: 232--234. 1832.

Synonymy: Lippia attemuata Mart., Flora 21, Beibl. 2: 59. 1838. Aloysia attemuata Walp., Repert. Bot. Syst. 4: 42. 1845. Lippia hirsuta f. vernonioides (Cham.) Kuntze, Rev. Gen. Pl. 3 (2): 252. 1898. Lippia caniflora Mart. ex Moldenke, Alph. List Invalid Names Suppl. 1: 13, in syn. 1947. Lippia hirsuta α vernonioides (Cham.) Kuntze ex Moldenke, Résumé Suppl. 9: 4, in syn. 1964. Lippia hirsuta var. vernonioides (Cham.) Kuntze ex Moldenke, Résumé Suppl. 12: 10, in syn. 1965. Lippia hirsuta f. latifolia Kuntze ex Moldenke, Résumé Suppl. 12: 10, in syn. 1965. Lippia hirsuta f. longifolia Kuntze ex Moldenke, Résumé Suppl. 12: 10, in syn. 1965.

Bibliography: Cham., Linnaea 7: 232—234. 1832; Mart., Flora 21, Beibl. 2: 59. 1838; Steud., Nom. Bot., ed. 2, 2: 54. 1840; D. Dietr., Syn. Pl. 3: 600. 1843; Walp., Repert. Bot. Syst. 4: 42 & 54. 1845; Benth., Pl. Hartw. 245. 1846; Schau. in A. DC., Prodr. 11: 589. 1847; Schau. in Mart., Fl. Bras. 9: 244. 1851; Hiern, Vidensk. Meddel. Kjøbenh. 1877—1878: 99. 1877; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; S. Moore, Trans. Linn. Soc. Lond. Bot., ser. 2, 4: 436. 1895; Kuntze, Rev. Gen. Pl. 3 (2): 252. 1898; H. H. Rusby, Bull. Torrey Bot. Club 27: 80. 1900; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 542. 1911; T. Herzog, Meded. Rijksherb. Leiden 29: 44. 1916; Moldenke, Lilloa 5: 432. 1940; Moldenke, Suppl. List Invalid Names 1 & 5. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37, 38, 40, 95, & 96. 1942; Moldenke, Alph. List Invalid Names 4. 1942; Moldenke, Alph. List Cit. 1: 30, 92, 120, 121, 177, 223, 231, & 289. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 13. 1947; Moldenke, Phytologia 2: 336. 1947; Moldenke, Lilloa 13: 9 (1947) and 14: 48. 1948; Moldenke, Alph. List Cit. 2: 362, 365—367, 444, 535, 552, 553, 608, & 628 (1948), 3: 690, 704, 705, 709, 751, 846, 856, 884, 923, 966, & 968 (1949), and 4: 1124 & 1292. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81, 97, & 191. 1949; F. C. Hoehne, Ind. Bibl. & Num. Pl. Col. Com. Rondon 349. 1951; Moldenke, Phytologia 4: 70. 1952; Moldenke, Résumé 94, 114, 233, 310, 311, 315, & 463. 1959; Moldenke, Phytologia 12: 24, 102, 207, & 224. 1965; Moldenke, Résumé Suppl. 12: 10. 1965.

Shrub or shrublet, 0.8--1.8 m. tall; stems erect, 0.3—0.6 m. tall, simple or forked, tetragonal, hirsute; leaves decussate-opposite or ternate, variable in size and shape; petioles short, hirsute; leaf-blades rigid, ovate or elliptic to oblong, 7.5—10 cm. long, 2.5—4 cm. wide, acute at the apex, crenate-serrate along the margins except at the entire base, acuminate and attenuate or cuneate-attenuate into the petiole at the base, penninerved, rugose, strigose-hispid or strigose-hirsute above with short callose hairs, paler and subtomentose beneath and hirtous on the venation, the pubescence sometimes more strigose, sometimes more pilose; inflorescence white or grayish-white to greenish-white, terminal, paniculate, cymose, with opposite subdichotomous branches, sometimes loose and pyramidal, sometimes contracted and fastigiate;

heads squarrose, strobiliform, globose or ovoid, many-flowered, 6—8 mm. wide, finally becoming subcylindric and almost 1.5 cm. long, the lateral ones sessile; bractlets imbricate, scale-like, obovate, subrhomboid-rounded toward the apex, mucronate at the apex, incano-holosericeous on the back, cuneate-unguiculate and glabrous toward the base, equaling the corolla-tube; calyx very short, shortly bifid, villose, adherent to the mature fruit; corolla hypocrateriform, white or whitish to yellow-white, sometimes white with a yellow throat or white with a yellow or yellowish to rose center, slightly more than 3 mm. long, villous-pubescent on the outside, the tube clavate-infundibular, the upper lobes of the limb short, the lowest expanded and subquadrate; fruit splitting into 2 seeds, typical of the genus.

The type of this species was collected by Friedrich Sellow in São Paulo, Brazil, and was deposited in the herbarium of the Botanisches Museum at Berlin, where it was photographed by Macbride as his type photograph number 17552, but is now destroyed. Chamisso, in his original description (1832), says merely "E Brasilia misit Sellow." The type of L. attenuata was collected by Carl Friedrich Philipp von Martius (no. 224) near Cujaba, Mato Grosso, Brazil, in May, 1833, and is deposited in the herbarium of the Botanisches Museum in Munich. The type of L. hirsuta f. latifolia was gathered by Carl Ernst Otto Kuntze at an altitude of 400 meters at Yapacani, Santa Cruz, Bolivia, in 1892, and is deposited in the Britton Herbarium at the New York Botanical Garden.

Schauer (1847) places L. vernonioides in his Section Zapania, Subsection Paniculatae. Moore (1895) compares it with his L. jangadensis, to which he points out that it is closely related. Steudel (1840) and Walpers (1845) regarded both L. vernonioides and L. attenuata as valid species.

The plant has been found growing on campos, hilly or dry campos, and on terrafirma, among rocks on high campos, in open grassy soil, sandy places at the edge of woods, dryish open grassy places on the ascent of mountains, cerrados near roadsides, dry grassy places, and swampy or rather wet shady places, at altitudes of 200 to 800 meters, blooming from October to July, fruiting in April, June, October, and December. Macedo refers to it as "arbusto campestre pubescente", while Steinbach notes "la flores salen poco a poco en las puntas de las inflorescencias" and also "con raiz tubercula leñosa, que crece hasta el tamano de una manzana".

The flowers are described as "yellow-white" on Mendes Magalhães 19025; "white" on A. P. Duarte 778, G. Gehrt s.n., Hoehne & Gehrt s.n., Murça Pires & Black 2146 & 2361, and Steinbach 5581; "white with yellow throat" on Herzog 1484 and Malme 3433a; "white with yellowish center" on Steinbach 7027; "brancas con centro róseo e amarelo" on Macedo 2288; and "brancas com centro amarelo" on Macedo 2292.

In the Instituto Miguel Lillo the Herzog reference given in the bibliography above is cited as "Herzog, Bolivia III (1916) 44" and

the Rusby reference as "Rusby, Bolivia Bulletin XXVII (1900) 80."

Material has been misidentified and distributed in herbaria as Lantana sp. On the other hand, the P. Clausen s.n. [Minas Geraes] distributed in the Dudley Herbarium (no. 166590) as L. vernonioides is actually Hyptis microphylla Pohl in the Lamiaceae.

Schauer (1851) cites a Lund s.n., L. Riedel s.n., and Sellow s.n. from São Paulo, L. Riedel s.n. [in campis siccis prope Barbacenam] from Minas Geraís, and L. Riedel s.n. and Silva Manso s.n. [Herb. Martius 224] from Matto Grosso.

In all, 79 herbarium specimens, including type material of all the names involved, and 9 mounted photographs have been examined by me.

Citations: BRAZIL: Goiás: G. Gardner 3946 (Cb); Murça Pires & Black 2361 (Z). Maranhão: Murça Pires & Black 2146 (N), 2319 (N). Matto Grosso: Herb. Rio de Janeiro 46804 (Ja); F. C. Hoehne Com. Rondon 194 (Sp), 1304 (N); Malme 1692 (S), 3433 (S), 3433a (S); Martius 224 [87] (Br, F--photo, N--photo, Si--photo, Z--photo); Pilger 571 (B). Minas Gerais: A. P. Duarte 778 [Herb. Jard. Bot. Rio Jan. 58834] (N); Hoehne & Gehrt s.n. [Turvo, April 24, 1926] (N, Sp--17475); Macedo 2288 (N), 2292 (N, S); Mendes Magalhães 19025 [Herb. Brad. 28163] (N); Mosén 1993 (S), 4319 (N, S); Regnell III.944 [Caldas, 1845] (S), III.944 [Caldas, 30/1/1865] (S, W--1323001), III.944 [6/11/1870] (W--274925), III.944a (S); A. Saint-Hilaire D.455 (W--2383080); Widgren s.n. [1845] (S). Pará: Murça Pires 2361 (N). São Paulo: Edwall s.n. [Morro Pellado, June 1904] (N, Sp--8351); G. Gehrt s.n. [Itarapina, April 30, 1923] (N, Sp--8351); F. C. Hoehne s.n. [Mogy-mirim, May 21, 1927] (N, N, Sp--20411); W. Hoehne 2709 (Bh, It, Ml, N, Qu, Ug, W); Kiehl s.n. [Herb. Inst. Agron. Est. 3764] (N, Sp--41982); Riedel & Lund 2073 (N); Sellow s.n. [Brasilia; Macbride photos 17552] (It--photo of type, Kr--photo of type, N--photo of type, N--photo of type, W--photo of type). State undetermined: J. E. Pohl s.n. [Brasiliae; Com. Mus. Caes. Vindob. 1839] (Br). BOLIVIA: El Beni: Fleischmann 306 (S); H. H. Rusby 927 (C, Pa, Pa, Pr, Pr, W--72953). La Paz: M. Cárdenas 1935 (N); H. H. Rusby 926 (C). Santa Cruz: M. Cárdenas 2028 (N); T. Herzog 1484 (S); Kuntze s.n. [Prov. Velasco, VII.92] (N, N, W--701988), s.n. [Yapacani, 1892] (N); Peredo s.n. [Los Arroyitos, 6.XII.1946] (N, S); Steinbach 2074 (Ra--33058), 5581 [Herb. Osten 17922] (N, Ug), 6306 (A), 7027 (Ca--368480, N, N, S, Ut--91356).

LIPPIA VILLAFLORIDANA Kuntze, Rev. Gen. Pl. 2 (3): 253--254. 1898.

Synonymy: Lippia floridana Kuntze ex Moldenke, Suppl. List Invalid Names 5, in syn. 1941. Lippia verticillata Legrand ex Moldenke, Résumé 318, in syn. 1959. Lippia villafloridana Kuntze ex Moldenke, Résumé 318, in syn. 1959.

Bibliography: Kuntze, Rev. Gen. Pl. 2 (3): 253—254. 1898; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 106. 1904; Moldenke, Torreya 34: 9. 1934; Moldenke, Suppl. List Invalid Names 5. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96. 1942; Moldenke, Alph. List Invalid Names 30. 1942; Moldenke, Lilloa 8: 427 (1942) and 14: 48. 1948; Moldenke, Alph. List Cit. 2: 627 (1948) and 3: 690. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99 & 191. 1949; Moldenke, Phytologia 3: 289 & 376. 1950; Moldenke, Résumé 94, 117, 119, 312, 318, & 463. 1959; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Rambo, Pesquis. Bot. 21: 28—29 & [59]. 1965; Moldenke, Phytologia 12: 92 & 136 (1965) and 13: 29. 1966.

Dioecious perennial shrub or subshrub, very small, 10—15 cm. tall, few-branched, only the lowest portion woody; branches herbaceous, 5—10 cm. long; leaves 4—6, decussate-opposite or approximate, ovate, nigrescent in drying, to 3.5 cm. long and 1.5 cm. wide, cuneate at the base, incised-dentate along the margins, penninerved, strigose; peduncles axillary, very long, 2—4 times as long as the subtending leaves; heads subglobose, to 20-flowered, 4—6 mm. wide; bractlets lanceolate or ovate, acute at the apex, strigose, the ordinary hair intermixed with smaller glanduliferous hairs, subequaling the flowers; calyx very small, repand-4-dentate; corolla hypocrateriform, yellow or clear-yellow, the tube conic, the limb oblique, 4-lobed, one of the lobes larger than the others; stigma obliquely bilobed; fruit pubescent but scarcely glandulose on the outside, splitting subspontaneously into 2 cocci on maturity.

The type of this species was collected by Carl Ernst Otto Kuntze at Villa Florida, Paraguay, on October 2, 1892, and is deposited in the Britton Herbarium at the New York Botanical Garden — an isotype deposited in the herbarium of the Botanisches Museum at Berlin was photographed there by Macbride as his type photograph number 17553, but is now destroyed. The type of L. verticillata was collected by Carlos María Diego Enrique Legrand (no. 4524) in rocky ground at Río Yi, department of Florida, Uruguay, on November 2, 1946, and is deposited in the herbarium of the Museo Nacional at Montevideo.

The species has been found growing in meadows and quebradas, on rocky and dry grassy campos, between arroyos, and on rocky ground, flowering in January, March, April, and November, fruiting in January. The flowers are described as "yellow" on Gallinal, Aragone, Bergalli, Campal, & Rosengurtt PE.5171, Rambo 3033, and Rosengurtt B.4581, and as "clear-yellow" on Legrand 4524. Material has been misidentified and distributed in herbaria under the names L. imbricata Kuntze and L. turnerifolia Cham.

Kuntze (1898) says "Der Kelch ist ziemlich flach und ausgeschweisst gezähnt, sodass dieses Material nicht zur Trennung von Lantana Camara durchgreifend ist." Rambo (1965) cites his collection in Herb. Anchieta 3033 from Rio Grande do Sul, Brazil.

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS LIPPIA. XI

Harold N. Moldenke

LIPPIA VILLAFLORIDANA Kuntze

Additional bibliography: Moldenke, Phytologia 13: 167—168. 1966.

Rambo (1965) describes this plant as a "Small plant, leaves almost rosette like, stalk of the inflorescence comparatively longer than the stem", growing on "Dry, grassy Campos" in the "Northwestern Highlands only" in Rio Grande do Sul, with a general distribution of "Paraguay, RGS".

In all, 10 herbarium specimens, including type material of most of the names involved, and 5 mounted photographs have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Castellanos s.n. [Santa Ana do Livramento; Herb. Inst. Miguel Lillo 15763] (N); Rambo 3033 (Rb). PARAGUAY: Kuntze s.n. [Villa Florida, 2/X/92; Macbride photos 17553] (It—photo of isotype, Kr—photo of isotype, N—type, N—photo of isotype, N—photo of isotype, W—photo of isotype). URUGUAY: Castellanos s.n. [cerce Arroyo Catalancito; Herb. Inst. Miguel Lillo 15764] (N), s.n. [Río Yi; Herb. Inst. Miguel Lillo 15773] (N); Gallinal, Aragone, Bergalli, Campal, & Rosengurtt PE.5171 (N); Legrand 3489 (N), 4524 (N, Ug); Rosengurtt B.4581 (N).

LIPPIA VOLKII Moldenke, Phytologia 5: 226—227. 1955.

Bibliography: Moldenke, Phytologia 5: 226—227. 1955; Moldenke, Résumé 152 & 463. 1959; G. Taylor, Ind. Kew. Suppl. 12: 82. 1959; Moldenke, Biol. Abstr. 30: 3551. 1956; Anon., Assoc. Etud. Fl. Afr. Trop. Ind. 1955: 63. 1956.

Stems apparently long and slender, obtusely tetragonal, more or less longitudinally striate-sulcate, glabrous or minutely puberulous in the sulcations on the younger parts, with rather few short side-branches; nodes annulate; principal internodes 3—8 cm. long; leaves decussate-opposite, usually clustered on greatly abbreviated twigs, usually conduplicate-folded in pressing; petioles very slender, 1—2 mm. long, very minutely puberulous; leaf-blades thin-chartaceous, uniformly grayish-green on both surfaces, oblong or oblong-lanceolate, 2—5 cm. long, 4—10 mm. wide, acute or subacute at the apex, shallowly crenate or subentire, acute at the base, glabrous and densely resinous-punctate on both surfaces; midrib very slender, impressed above, prominulous beneath; secondaries very slender, 5 or 6 per side, arcuate-ascending, not anastomosing at the margins, somewhat impressed above and prominulous beneath; veinlet reticulation sparse, inconspicuous on both surfaces; inflorescence capitate, fasciculate in the twig-axils and uppermost leaf-axils, usually 4 or 6 per node, 1—2.7 cm. long, ascending; peduncles very slender, very minutely puberulous and resinous-punctate, 3—15 mm. long; heads oblong, 5—10 mm. long, 5—7 mm. wide, densely many-flowered, compact, not elongating af-

ter anthesis; bractlets broadly ovate, about 3 mm. long and 2.5 mm. wide, acuminate at the apex, densely puberulent and resinous-punctate, ciliolate along the margins; corolla-tube 3—3.5 mm. long, densely puberulent outside, the limb about 2 mm. wide, densely puberulent on the outer face.

The type of this species was collected by Otto Heinrich Volk — in whose honor it was named — somewhere in Southwest Africa in or about 1951 and is deposited in the Staatsherbarium at Munich. In all, 2 herbarium specimens, including the type, have been examined by me.

Citations: SOUTHWEST AFRICA: Volk s.n. (Mu—type, Z—isotype).

LIPPIA WHYTEI Moldenke, Phytologia 1: 428—429. 1940.

Bibliography: Moldenke, Phytologia 1: 428—429 (1940) and 1: 504. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 96. 1942; Moldenke, Phytologia 2: 340 & 341. 1947; E. J. Salisb., Ind. Kew. Suppl. 10: 134. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 89. 1948; Moldenke, Alph. List Cit. 2: 585 (1948), 3: 815, 903, & 977 (1949), and 4: 1032, 1049, 1060, 1123, & 1248. 1949; Moldenke, Phytologia 3: 138. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115—120 & 191. 1949; Brenan, Mem. N. Y. Bot. Gard. 9 (1): 36. 1954; Moldenke, Résumé 142, 143, 145, 146, 148, 149, & 463. 1959; Moldenke, Phytologia 12: 230, 233, & 307. 1965.

Strongly aromatic herb, shrub, or subshrub, 0.8—2 m. tall; stems and branches slender, obtusely tetragonal, brownish, the younger parts densely short-pubescent with sordid hairs, the older parts puberulent with minute brownish hairs; nodes plainly annulate; principal internodes 1.5—4.5 cm. long; leaves decussate-opposite; petioles 2—5 mm. long, alate-margined, sparsely short-pubescent; leaf-blades firmly chartaceous, dark-green above, lighter beneath, lanceolate or elliptic, 2.5—4 cm. long, 8—18 mm. wide, acute or short-acuminate at the apex, regularly crenulate from the base to the apex, acute or acuminate at the base, bullate and very scabrous above, densely tomentellous with sordid-grayish hairs beneath; midrib, secondaries, and veinlet reticulation deeply impressed above, only the larger portions (midrib and secondaries) prominulous beneath; inflorescence axillary, abundant toward the tips of the branches, a pair in each axil; spikes sessile or subsessile, subcapitate, to about 12 mm. long and 10 mm. wide, very densely many-flowered; bractlets ovate, about 2 mm. long, sharply acute or short-acuminate at the apex, strigose with short sericeous hairs; flowers very small, hardly surpassing the bractlets, described as green, white, or purple; fruit brown, dry.

The type of this species was collected by Alexander Whyte — in whose honor it was named — in northern Malawi, and is deposited in the Britton Herbarium at the New York Botanical Garden. It was originally confused with Lantana rugosa Thunb. of South Africa, which has long-pedunculate heads and fleshy fruit. It has been found growing in sandy soil, open forests, and alluvial soil at river edges, at altitudes of 1330 to 2500 meters, flowering in January, February, May, and August to October, fruiting in

March, May, September, and October. Dümmer refers to it as "locally frequent" in Uganda. A vernacular name recorded for it is "kengekioudet". The flowers are described as "white" on Dümmer 3736 and Garcia 315, "green" on T. H. E. Jackson 423, and "purple" on Borle 306.

Brenan (1954) reduces L. whytei to synonymy under L. javanica (Burm. f.) Spreng., saying "this plant appears to me to be scarcely more than a narrow-leaved, subsessile-flowered form of L. javanica."

Material has been misidentified and distributed in herbaria under the names L. adoënsis Hochst., L. africana Moldenke, L. asperifolia A. Rich., "L. asperifolia Rich. vel forma", L. capensis (Thunb.) Spreng., L. javanica (Burm. f.) Spreng., L. oatesii Rolfe, and Lantana salviaefolia Jacq. In all, 31 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: CONGO LEOPOLDVILLE: Quarré 87 (N), 1146 (Br), 1950 (Br), 4486 (Br, N), 5240 (Br, N), 5384 (Br); "J. F. W." 469 (Br). UGANDA: Dümmer 3736 (W—1172961). TANGANYIKA: Piemeisel & Kephart 513 (W—1373312); Rounce 231 (K); Schlieben 319 (Br). KENYA: T. H. E. Jackson 423 (K); Mearns 256 (W—630270); Piemeisel & Kephart 52 (W—1373488). ZAMBIA: Borle 306 (Af, W—1028994). SOUTHERN RHODESIA: N. C. Chase 208 [Govt. Herb. Salisbury 14735] (K); Herb. Albany Mus. 3 (K); A. Peter 30691 [V.21] (B), 45347 [C.23] (B). MALAWI: McClounie 67 (K); Stolz 351 (S, W—633750); Whyte s.n. (F—photo of type, K—isotype, N—type, N—photo of type, Sg—photo of type, W—550845—isotype, Z—photo of type). PORTUGUESE EAST AFRICA: Manica e Sofala: Garcia 315 (Ul). Niassa: R. Monteiro 34 (Ul). Zambezia: Torre 3637 (Ul).

LIPPIA WILMSII H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 196. 1901.

Synonymy: Lippia africana Moldenke, Phytologia 2: 469. 1948. Lantana ochroleuca Dinter ex Moldenke, Résumé 306, in syn. 1959.

Bibliography: H. H. W. Pearson in Thisel.-Dyer, Fl. Cap. 5: 196. 1901; A. W. Hill, Ind. Kew. Suppl. 6: 117. 1926; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 96. 1942; Moldenke, Alph. List Invalid Names 29. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 89. 1948; Moldenke, Phytologia 2: 469 & 483 (1948) and 3: 77. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 121, 122, 189, & 191. 1949; Moldenke, Phytologia 3: 292 & 293 (1950) and 3: 456—458. 1951; Wild, Victoria Falls Handb. 158. 1953; E. J. Salisb., Ind. Kew. Suppl. 11: 138. 1953; Moldenke, Phytologia 5: 98. 1954; Moldenke, Inform. Mold. Set 49 Spec. 2 (1954) and 51 Spec. 3. 1956; Moldenke, Résumé 145, 148—150, 153, 154, 306, 308, & 463. 1959; Moldenke, Résumé Suppl. 1: 10 (1959), 3: 16 & 33 (1962), and 12: 6, 7, & 11. 1965; Moldenke, Phytologia 12: 98, 172, 212, 229, 231, 232, 358, 436, 458, 459, 461, & 462. 1965;

Wild, Kirkia 5: 4. 1965.

Suffrutescent herb, undershrub, subshrub, or erect aromatic shrub, 0.5—1 m. tall; rootstock perennial; stems terete or subangular, scabrid-pubescent, glandular; branches rather slender, rather obtusely tetragonal, strigose with whitish antrorse hairs and rather densely resinous-granular; nodes annulate; principal internodes 3—5.8 cm. long; leaves decussate-opposite, sweet-scented when crushed, with the odor of lemon-rind, usually with a cluster of smaller ones on much abbreviated twigs in their axils; petioles very slender, 1—3 mm. long, antrorsely strigose and resinous-granular like the branches; leaf-blades chartaceous, bright-green on both surfaces, elliptic to narrowly elliptic or elliptic-oblong, 2.5—7.5 cm. long, 0.8—1.6 cm. wide, obtuse or subacute to acute at the apex, serrate or regularly appressed-serrate along the margins, acute at the base and cuneately narrowed into the petiole, rugose, scabrid-pubescent or strigose above with bulbous-based antrorse hairs and subbullate, densely short-pubescent and densely resinous-granular beneath or scabrid-pubescent only on the larger venation beneath and elsewhere glabrous but densely punctate (glandular-punctate); midrib very slender, impressed above, prominent beneath; secondaries 2—7 per side, very slender, ascending or arcuate-ascending, impressed above, prominent or only the larger parts prominulous beneath; inflorescence spicate, abundant, 2 or 3 per node, usually borne at each of the upper 8 or more nodes, surpassing the subtending leaves; peduncles slender, terete below, tetragonal upwards, 2—4.5 cm. long, striate, pubescent or scabrid-pubescent and glandular to densely strigillose and resinous-granular, rarely terminated by 2 equal divergent spikes; floriferous spikes subglobose or subcapitate, solitary or in pairs, elongating later to 1.4 cm., 6—9 mm. wide, densely many-flowered; bractlets narrowly ovate or ovate, acuminate or attenuate-acuminate at the apex, truncate at the base, pubescent and glandular or densely strigose and resinous-gramular, the outer ones 8 mm. long and 2.5 mm. wide, the inner ones 5—6 mm. long and 1.5—2 mm. wide; flowers small; calyx 1.5—3.5 mm. long, distinctly 4-veined, pubescent outside, glabrous within, the rim truncate or obscurely 4-toothed; corolla hypocrateriform, yellow, pale yellowish-white, or white to violet, 5—6 mm. long, about twice as long as the calyx, usually subequaling the subtending bractlet, the tube pubescent on the upper portion outside or puberulent-gramular at the apex on the back, more densely so in the lateral regions, glandular, glabrous within, the limb 1.5—2 mm. wide, the lobes entire, the anterior one larger; ovary and style together 3—3.5 mm. long; fruit shortly oblong, 2 mm. long, 1—1.5 mm. wide, plano-convex, flattened at the commissure, smooth or very delicately sculptured, glabrous.

The type of this perplexing species was collected by Frederick Wilms (no. 1180) -- in whose honor it was named — near Lydenburg, Transvaal, South Africa. The type of L. africana was collected by Erik Wall also in the Transvaal, on October 3, 1938, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at

Stockholm. The type of Lantana ochroleuca was gathered by Kurt Dinter (no. 5482) in January in Southwest Africa and is deposited in the herbarium of the Botanisches Museum at Berlin.

The species has been found growing in bankenveld and bush on quartzite ridges, herbaceous savannas, gallery forests, Acacia savannas, subtropical gum woodlands, grasslands and grassveld, grassveld with scattered trees and annual fires, burned grassland, and river valleys, on open hillsides and recently fireswept slopes, at altitudes of 480 to 1500 meters, flowering from October to February and in April and August, fruiting from October to December. Rattray calls it a "common shrub in open", Tanner says of it "growing in groups on loam and gravel", while on Herb. Centr. Research Stat. Mazabuka 186 we read "common, not grazed, suspected of causing acute gastro-enteritis". A vernacular name is "ubugororo".

The flowers are described as "violet" on Troupin 5702, "yellow" on N. C. Chase 1885 and Eyles 8770, "pale yellowish-white" on Meeuse 9029, and "white" on Acock 8373, L. E. Codd 4904, Eyles 5228, Liebenberg 2762, H. M. Lloyd 46, and Meeuse 9236.

Pearson (1901) distinguishes this species from some related South African ones as follows:

1. Calyx distinctly 2-lobed.
   2. Bractlets more than 4 mm. long and 3 mm. wide, surpassing the flowers.....L. scaberrima.
   2a. Bractlets less than 4 mm. long and 3 mm. wide, not surpassing the flowers.....L. javanica.

1a. Calyx truncate, subtruncate, or obscurely lobed.
   3. Leaf-blades serrate or crenate-serrate.
      4. Bractlets more than 4 mm. long; calyx truncate or obscurely 4-toothed.....L. wilmsii.
      4a. Bractlets less than 4 mm. long; calyx obscurely 2-lobed.....L. rehmannii.
   3a. Leaf-blades crenate.....L. pretoriensis.

Meeuse, in a letter to me dated December 9, 1953, says: "The Lippia material is extremely variable and some of Pearson's species definitely must be sunk. His calyx-character (distinctly lobed or indistinctly lobed to truncate) is useless, to my mind, so that L. wilmsii cannot on very good grounds be separated from L. scaberrima, and the three L. rehmannii-bazeiana-pretoriensis are also very close." In a letter dated September 28, 1953, he says: "I am inclined to believe that Pearson's L. rehmannii, L. wilmsii, L. bazeiana and L. pretoriensis can hardly be different from 'L. asperifolia' (=L. javanica)".

Miss J. L. Warren, in a letter to me dated July 5, 1961, says: "Three species of Lippia are found in the area, Lippia javanica (Burm. f.) Spreng., Lippia scaberrima Sond., and Lippia wilmsii Pearson. The first two are easily distinguishable using bract characteristics as in Flora Capensis but I do not consider the

criteria used in Flora Capensis to distinguish Lippia wilmsii Pearson infallible. I have studied the records of Lippia in the National Herbarium, Pretoria, amongst which are specimens personally identified by you, but I am still not satisfied as to the characteristics which have been used to separate Lippia wilmsii Pearson from Lippia javanica (Burm. f.) Spreng."

Material of L. wilmsii has been misidentified and distributed in herbaria under the names L. asperifolia Hochst., L. asperifolia Rich., L. bazeiana H. H. W. Pearson, L. pedunculata H. H. W. Pearson, L. scaberrima Sond., and Lantana salvifolia Jacq. On the other hand, the Troupin 6014 & II.832, distributed as L. wilmsii, are var. villosa (Moldenke) Moldenke, Troupin II.670 is L. grandifolia Hochst., and J. Buchanan 1381 and Shantz 267 are L. woodii Moldenke.

Pearson (1901) cites the following: KENYA: Scott-Elliot 6484. ZAMBIA: Cecil 219. MALAWI: J. Buchanan 1381; Whyte s.n. [Mount Zomba, 4000—6000 ft.]. SOUTH AFRICA: Transvaal: Wilms 1180.

In all, 67 herbarium specimens, including type material of all the names involved, and 10 mounted photographs have been examined by me.

Citations: RUANDA & URUNDI: Troupin 5702 (N), 8755 (N), 8871 (Hi—206785). TANGANYIKA: H. M. Lloyd 46 (K); Tanner 4562 (S). ZAMBIA: C. E. F. Allen 324 (Af, K, Rh); Herb. Centr. Research Stat. Mazabuka 186 (Af, Cb), 248 (Af). SOUTHERN RHODESIA: N. C. Chase 678 [Govt. Herb. Salisbury 20486] (N), 1885 (Rh—27086); F. Eyles 5228 (Rh), 8770 (K); J. C. Hopkins s.n. [15/11/37] (Rh—6632); Obermeyer 2238 (Af); A. J. Teague 186 (K); J. A. G. Walker 2427 (Rh); O. West 2286 (Rh—25384); Wild 2069 (Rh—17950). MALAWI: J. Buchanan 136 (N), 765 (W—248231, W—807104). PORTUGUESE EAST AFRICA: Mozambique: A. Peter 51166 [S.66] (B); Rattray 1103 (Rh—19549). SOUTHWEST AFRICA: Baum 250 (F—photo, K, N, N—photo, Sg—photo, Z—photo); Dinter 5482 (Af, B, Br, N, S). SOUTH AFRICA: Cape of Good Hope: J. P. H. Acock 8373 (N, S). Transvaal: Breyer s.n. [Herb. Transvaal Mus. 18325] (Af); L. E. Codd 3371 (Ss), 4904 (Ss); E. E. Galpin 578, in part (Af), 9411 (Af); Hepturn & Acock 1321 (S), 1324 (S, S); Kassner 139 (Br); H. Lang s.n. [Herb. Transvaal Mus. 32208] (Tm); Leendertz 1322 [Herb. Transvaal Mus. 5587] (Af), 2202 [Herb. Transvaal Mus. 7326] (Af, Cb), s.n. [20.X.1909] (Cb); L. C. C. Liebenberg 2762 (Af), 3187 (Af); Marloth 5448a (Af); Meeuse 9029 (Af), 9236 (Z); Mes s.n. [10. 1917] (Cb); Nogg 14129 (Af); Pott 5648 (Cb); F. A. Rogers 25077 [Herb. Transvaal Mus. 20966] (Af); Schweickerdt 1299 (Af, Cb); C. A. Smith 744 (Af); E. Wall s.n. [1/10/1938] (N, S), s.n. [3/10/1938] (F—photo, K—photo, N—photo, S, Si—photo, Z—photo), s.n. [20/10/1938] (N, S); Wilms 1180 [Herb. Transvaal Mus 5889] (Af—isotype, N—photo of type).

LIPPIA WILMSII var. SCABERRIMA (Moldenke) Moldenke, Phytologia 4: 179. 1953.

Synonymy: Lippia africana var. scaberrima Moldenke, Phytologia 3: 38—39. 1948.

Bibliography: Moldenke, Phytologia 3: 38—39 (1948) and 3: 77 & 138. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 120, 122, & 189. 1949; Moldenke, Phytologia 3: 458 (1951) and 4: 179. 1953; Moldenke, Biol. Abstr. 27: 1887 & 2026. 1953; Hauman, Assoc. Etud. Tax. Fl. Afr. Trop. Index 1954; Moldenke, Résumé 149, 154, & 463. 1959; Moldenke, Résumé Suppl. 3: 16 & 33. 1962.

This variety differs from the typical form of the species in its leaf-blades being to 10 cm. long and 3.5 or more cm. wide, very scabrous above with decidedly bulbous-based hairs, and the spreading-hirsute hairs on the branches, branchlets, peduncles, bractlets, and calyx also being bulbous-based and interspersed in the inflorescence with resinous granules. It is described by Rodin as a bush, 1 m. tall, with white flowers and purple fruit.

The type of the variety was collected by P. Krook [Penther 1765] along the Tsitsa River, Griqualand East, South Africa, on January 22, 1895, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. The plant has been found in mountainous areas with many springs and streams, with some wooded and some grassy areas on basically dolomites and limestone covered with deep humus in many places, flowering from December to February, fruiting in February, at altitudes of 6000 to 7000 feet.

Material has been misidentified and distributed in herbaria as Lantana salvifolia Jacq. In all, 5 herbarium specimens, including type material of both names involved, and 4 mounted photographs have been examined by me.

Citations: SOUTHERN RHODESIA: R. G. N. Young 882 (Rh). MALAWI: Whyte s.n. [Nyika Plateau] (K). SOUTH AFRICA: Cape of Good Hope: Krook s.n. [Penther 1765] (F--photo of type, N--isotype, N--photo of type, S--type, Si--photo of type, Z--photo of type). Transvaal: Rodin 3871 (Ca--802252).

LIPPIA WILMSII var. VILLOSA (Moldenke) Moldenke, Phytologia 4: 180. 1953.

Synonymy: Lippia africana var. villosa Moldenke, Phytologia 2: 469—470. 1948. Lippia wilmsii var. tomentosa Moldenke, Résumé 145 & 463, nom. nud. 1959.

Bibliography: Moldenke, Phytologia 2: 469—470 & 482 (1948) and 3: 137. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 116, 118, 119, & 189. 1949; Moldenke, Phytologia 3: 292 (1950), 3: 456—458 (1951), and 4: 180. 1953; Moldenke, Biol. Abstr. 27: 1887 & 2026. 1953; Hauman, Assoc. Etud. Tax. Fl. Afr. Trop. Index. 1954; Moldenke, Résumé 142, 143, 145, 146, 148, 149, & 463. 1959; Moldenke, Résumé Suppl. 3: 16 & 33 (1962) and 12: 6, 7, & 11. 1965.

This variety differs from the typical form of the species in the villous pubescence on its branches, twigs, petioles, leaf-

blades, peduncles, and bractlets, and in its larger flowering-heads, the heads being to 13 mm. wide and the bractlets to 7 mm. long. It is described by collectors as a suffrutescent perennial herb, 30—60 cm. tall, erect, many-stemmed, with a taproot and thick rootstock; sap colorless; flowers aromatic; corollas white or yellowish-white to pale-yellow, yellow, yellowish-brown, or primrose-yellow.

The type of the variety was collected by Ake Holm (no. 32) on a steppe on the western side of Mount Elgon, at an altitude of 2200 meters, Uganda, on March 20, 1938, and is deposited in the herbarium of the Naturhsitoriska Riksmuseum at Stockholm. Collectors have found the plant on steppes, deforested cattle-grazed hills in laterite soil sloping down to winding rivulets with a long fringe of trees, in grasslands and coppices, on dry open burned ground, in Brachystegia forests, and in gravel and stone on hillsides, at altitudes of 1400 to 2200 meters, flowering in March, May, and September to November. Quarré refers to it as "herbacée de 4/8 cm. de haut, racine souche ligneuse vivace, poussant 4 semaines après le passage des feux de brousse, début de végéta." Vernacular names recorded for it are "ubugorama" and "ubukorama".

Material has been misidentified and distributed in herbaria under the names Lippia africana Moldenke, L. asperifolia Rich., and L. wilmsii H. H. W. Pearson.

The flowers are described as "yellow" on Troupin 6014, "pale-yellow" on Troupin II.832, "yellowish-brown" on Tanner 1692, "white" on J. C. Hopkins s.n., "yellowish-white" on Maas-Geesteramus 4786, and "primrose-yellow" on Milne-Redhead 1155.

In all, 19 herbarium specimens, including type material of all the names involved, and 5 mounted photographs have been examined by me.

Citations: CONGO LEOPOLDVILLE: Cabu 66 (Br); Quarré 3531 (Br, Br, N). RUANDA: Troupin 6014 (W—2375316), II.832 (W—2375269). UGANDA: Holm 32 (F—photo of type, K—photo of type, N—isotype, N—photo of type, S—type, Si—photo of type, Z—photo of type). TANGANYIKA: Lynes D.15 (K), D.16 (K); Tanner 1692 (Ca—183151). KENYA: Maas-Geesteramus 4786 (Ca—92086, S); Thorold 2733 (K). ANGOLA: Huila: Dekindt 710 (Ul); E. J. Mendes 762 (Ul). ZAMBIA: E. Milne-Redhead 1155 (Br, K). SOUTHERN RHODESIA: J. C. Hopkins s.n. [15.12.40] (Rh—7863).

LIPPIA WOODII Moldenke, Phytologia 2: 318—319. 1947.

Bibliography: Moldenke, Phytologia 2: 318—319 & 341. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 120, 122, & 191. 1949; Moldenke, Alph. List Cit. 3: 931 (1949) and 4: 1025, 1038, 1071, 1140, & 1191. 1949; Moldenke, Phytologia 3: 458. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 138. 1953; Moldenke, Résumé 149, 154, & 463. 1959.

Low herbaceous plant; stems subterete toward the base, subtet-

ragonal toward the apex, mostly unbranched, densely puberulent, less densely so in age; nodes not annulate; principal internodes 3—14.5 cm. long; leaves decussate-opposite, few, very fragrant, usually with a very much abbreviated branchlet and a few small leaves in their axils; petioles slender, 1—5 mm. long, strigose-puberulent; leaf-blades chartaceous, rather grayish-green on both surfaces, apparently erect on the stem, narrowly elliptic, 4—6 cm. long, 8—12 mm. wide, scabrous and subbullate above, densely puberulent or short-pubescent beneath; midrib slender, impressed above; secondaries very slender, 4—6 per side, impressed above, ascending, not much arcuate, prominulous beneath; veinlet reticulation impressed above, prominulous beneath; inflorescence capitate-spicate, 2 per node at the uppermost 2 or 3 nodes, about equaling the subtending leaves; peduncles slender, 2—4.5 cm. long, densely short-pubescent with brown hairs; spikes capitate, about 1 cm. long, 1.2—1.4 cm. wide, densely many-flowered; bractlets narrowly lanceolate, the lowest about 7 mm. long, 2—2.5 mm. wide, long-acuminate or caudate at the apex, densely short-pubescent with subappressed hairs, far surpassing the flowers; corolla hypocrateriform, 3—4 mm. long, densely short-pubescent with whitish hairs on the outer surface, the limb 1—1.5 mm. wide.

The type of this species was collected by John Buchanan [J. M. Wood 6937] at Blantyre, Malawi, and is deposited in the herbarium of the Chicago Natural History Museum as sheet number 83373. It was named in honor of John Medley Wood who distributed the type collection.

The species has been found growing in sand veld, flowering in October and December. Material has been misidentified and distributed in herbaria as L. wilmsii H. H. W. Pearson, a species which it closely resembles and to which it is obviously closely related.

In all, 7 herbarium specimens, including the type, and 5 mounted photographs have been examined by me.

Citations: MALAWI: J. Buchanan 1381 (K, W—807314), s.n. [J. M. Wood 6937] (F—83373—type, F—photo of type, K—photo of type, M—photo of type, Si—photo of type, Z—photo of type). SOUTHERN RHODESIA: J. C. F. Hopkins s.n. [6/12/39] (N, Rh—7497). SOUTH AFRICA: Transvaal: Shantz 267 (W—1595613).

LIPPIA YUCATANA Loes. in Fedde, Repert. Nov. Sp. 9: 364. 1911.

Synonymy: Lippia albicaulis Greenm., Field Mus. Publ. Bot. 2: 340—341. 1912.

Bibliography: Loes. in Fedde, Repert. Nov. Sp. 9: 364. 1911; Greenm., Field Mus. Publ. Bot. 2: 340—341. 1912; Prain, Ind. Kew. Suppl. 5: 153. 1921; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1246. 1924; P. C. Standl., Field Mus. Publ. Bot. 3: 402 & 403. 1930; Moldenke, Suppl. List Common Names 18 & 24. 1940; Moldenke, Prelim. Alph. List Invalid Names 30. 1940; Moldenke, Carnegie Inst. Wash. Publ. 522: 164, 167—168, 219, 220, & 222.

1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 17 & 96. 1942; Moldenke, Alph. List Invalid Names 29. 1942; Moldenke, Phytologia 2: 107. 1945; Moldenke, Alph. List Cit. 1: 227—229, 299, 300, 316, 318, & 319 (1946), 2: 328 (1948), 3: 690 & 919 (1949), and 4: 1239. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 31 & 191. 1949; Moldenke, Résumé 37, 310, & 463. 1959; Moldenke, Phytologia 13: 35 & 162. 1966.

Shrub or tree, to 3 m. tall; trunk and stems white or silvery-white; older branches terete, covered with white bark, abundantly longitudinally fissured in age; young branchlets tetragonal, appressed-puberulent and minutely setose-aculeolate toward the apex, becoming glabrescent; petioles 4—8 mm. long, appressed short-puberulent; leaf-blades chartaceous, varying from oblong or ovate-oblong to ovate-elliptic, elliptic-lanceolate, or even obovate, 2.5—10 cm. long, 1—4 cm. wide, obtuse or rounded and short-apiculate at the apex or subacute, entire or densely crenulate-serrulate toward the apex with appressed teeth, cuneate at the base and rather conspicuously long-attenuate into the petiole, shortly and very densely hispidulous throughout above with bulbous-based hairs (the bases persistent), rather sparsely or more or less densely puberulent or appressed-puberulent to hirtellous beneath, especially on the venation, rather more velutinous beneath when young; peduncles axillary, 2—5 in each axil (rarely solitary), slender, often nutant, 0.8—3 cm. long, appressed-puberulent or substrigillose; heads subglobose, about 5 mm. long, 6—10 mm. wide; bractlets loosely imbricate, membranous, broadly ovate or subreniform, 4—7 mm. long, 4—9 mm. wide, acute or shortly subacuminate at the apex, cordate at the base, reticulate-veined, hirtellous-puberulent and glandular on the back, ciliate along the margins; calyx 1—2.5 mm. long, about 1.5 mm. wide, subvillous, its lobes obtuse and ciliolate; corolla small, hypocrateriform, its tube about 3 mm. long, ampliate toward the apex, sparsely pubescent and glandulose outside, pulverulent in the throat, 4-lobed, the lobes unequal, subrotund, the anterior one largest and about 2 mm. long.

The type of this species was collected by Georg Eduard and Caecilia Seler (no. 4918) at Chichen Itza, Yucatán, Mexico, on January 12, 1907, and was deposited in the herbarium of the Botanisches Museum in Berlin, where it was photographed by Macbride as his type photograph number 17554, but is now destroyed. The type of L. albicaulis was collected by George Franklin Gaumer (no. 971) near Izamal, Yucatán, and is deposited in the herbarium of the Chicago Natural History Museum.

This little-known species is said by Gaumer to be "shrubby, 10 feet high, uncommon, found only on the ancient mounds southwest of Izamal" and again "a shrub, 8 feet high, on brushlands, not common." The Selers describe it as a tree with silvery-white stems. Material has been misidentified and distributed in herbaria as L. umbellata Cav., a much-misunderstood species. The more striking characters distinguishing L. yucatana from L. umbellata and the several other species of this immediate group are

its smooth ashy-white stems and branches, puberulent branchlets, and dark-green elliptic-lanceolate mostly obtuse leaves which are only short-pubescent on both surfaces and often only very slightly so.

The species has been collected in anthesis in January and March, in fruit in March. Gaumer 23627 & 24411 have the younger leaves more densely velutinous beneath than is seen on any of the other collections. Standley (1924, 1930) erroneously reduces this species to synonymy under L. umbellata and records the vernacular name "salvia poblana", as well as "xoltemuuc" and "xoltémuuc".

In all, 25 herbarium specimens, including type material of all the names involved, and 17 mounted photographs have been examined by me.

Citations: MEXICO: Quintana Roo: Gaumer & sons 1475 (B, F—58273, S). Yucatán: G. F. Gaumer 871 (F—366714, G), 971 (Br, Ca—446213, Du—207660, F—37319, F—photo, G, Mi, N, N—photo, N—photo, S—photo, Si—photo, Z—photo, Z—photo), 2109 (F—58907, G, N), 23627 (F—466023, N), 23627 bis (F—466024), 24176 (F—552180, N, S), 24411 (F—552404); Hurmewell 18293 (G); Seler & Seler 4918 [Macbride photos 17554] (F—663083—photo of type, G—isotype, G—photo of type, Kr—photo of type, N—isotype, N—photo of type, N—photo of type, N—photo of type, N—photo of isotype, S—photo of type, Z—photo of type, Z—photo of isotype).

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ADDITIONAL NOTES ON THE GENUS VERBENA. I

Harold N. Moldenke

VERBENA [Dorst.] L.

Additional synonymy: Glandularia Troncoso, Biol. Abstr. 46 (21): B.53 & B.128, sphalm. 1965.

Additional bibliography: N. J. Anderss., Galap. Veg. 199—200. 1854; N. J. Anderss., Vet. Akad. Handl. Stockh. 1853: 199—200. 1855; H. B. Davis, Life & Works Pringle 21, 49, 104, 130, 132, 152, 169, & 193. 1936; Christie, Ark. Farm Res. 21 (9): 144. 1937; Dinlock & Ford, Phytopath. 40 (1): 7. 1950; Moldenke, Biol. Abstr. 33: 1215 (1959) and 35: 1688. 1960; Deitschman & Pruett, Proc. 17th N. Cent. Weed Control Conf. 1960; Goodspeed, Pl. Hunt. Andes 246. 1961; Reitz, Sellowia 13: 67 & 110. 1961; Clair, Of Herbs & Spices 153 & 232. 1961; Tergit, Fls. Through the Ages 233—234. 1961; Moldenke, Biol. Abstr. 36: 719, 2843, & 4036 (1961) and 37: 1062 & 2455. 1962; Brilmayer, All about Vines 350. 1962; Deitschman & Pruett, Weed Abstr. 11 (3): 211. 1962; Hocking, Excerpt. Bot. A.4: 592 (1962), A.5: 44 & 45 (1962), and A.6: 534—536. 1963; Rickett, New Field Book Am. Wild Fls. 280, fig. 98, & pl. 12. 1963; Bohm,

Pflanzenschutz 31 (4/5): 67—68. 1964; Bohm, Biol. Abstr. 45: 7066 (1964) and 45 (20): B.131. 1964; Troncoso, Darwiniana 13: 468—485, fig. 1—6. 1964; Soukup, Biota 5: 194. 1964; A. Webster, Carib. Gard. 18, 76, 129, & 138. 1964; Altman & Dittmer, Biol. Data Book 494. 1964; Matsumura, Amat. Herb. 25 (3-4): 42. 1964; Sharp & Baker, Castanea 29: 183. 1964; Perring & Walters, Fl. Cambridg. 179. 1964; R. Pearson, An. & Pl. Cenozoic Era 58 & 72. 1964; Loewenfeld, Herb. Gardening 214—216. 1964; Reitz & Klein, Sellowia 16: 73 & 117. 1964; Angely, Fl. Paran. 32: 69. 1964; Moldenke, Biol. Abstr. 45: 2772, 3136, 5377, 6658, 7026, & 8025 (1964) and 46: 632, 3616, & 3618 (1965), 46 (10): B.130 (1965), 46 (13): B.129 (1965), and 46 (15): B.127. 1965; Moldenke, Phytologia 11: 435—509 (1965) and 12: 6, 21, 27, 48—50, 55, 57, 63, 84, 87, 118, 205, 207, 211, 225, 226, 229, 230, 232, 265, & 288. 1965; Anon., Ind. Sem. Stich. Konink. Rotterdam. Dierg. [6]. 1965; Anon., Delect. Sem. Grad. Bot. Univ. Bucarest. 1964: 35. 1965; Cody, Ind. Sem. Pl. Res. Inst. Ottawa 1965: 31. 1965; Raymond, Ann. '65 Result. Jard. d'Essai Jard. Bot. Montreal 85. 1965; Florists' Rev. April 15. 1965; Anon., Biol. Abstr. 46 (9): B.131. 1965; Moldenke, Biol. Abstr. 46: 3246. 1965; Anon., Biol. Abstr. 46 (14): B.130 (1965), 46 (17): B.128 (1965), and 46 (21): B.53 & B.128. 1965; Moldenke, Résumé Suppl. 12: 1, 2, 5, 7, 8, 10, 12, & 13. 1965; Anon., Assoc. Etud. Fl. Afr. Trop. Index 1964: 56. 1965; Rambo, Pesquis. Bot. 21: 31—56, 58—[60]. 1965; Gooding, Loveless, & Proctor, Fl. Barbados 364 & 485. 1965; Neal, In Gard. Hawaii, new rev. ed., 720—722. 1965; Moldenke, Phytologia 12: 479—480. 1966; L. M. Reid, Park Management Ser. Bull. 5: 5 & 48. n.d.

In all, 39,033 herbarium specimens and mounted illustrations, as well as 1750 literature references, are cited in the main body of this work, of which this is the first supplement.

Additional abbreviations for the names of herbaria whose material is cited in this work are:

Ac = Aarhus University, Aarhus, Denmark
Av = Facultad de Agronomia y Veterinaria, Universidad de Buenos Aires, Buenos Aires, Argentina
Ib = Instituto de Botanica Agricola del I. N. T. A., Buenos Aires, Argentina
Ip = Escuela Nacional de Ciencias Biologicas, Instituto Politecnico Nacional, Mexico City, Mexico

Brilmayer (1962) speaks of the genus Verbena as follows, but probably is referring only to V. hybrida Voss, V. bipinnatifida Nutt., and V. peruviana (L.) Britton: "Tender perennials, hardy in Southern gardens, usually grown as annuals in cooler climates. Where growing seasons are short, they should be started early indoors. March-sown seeds should begin to flower in July. Or winter over a few stock plants indoors, and root cuttings in spring for earlier bloom. Verbenas make a splendid show in hanging baskets, or spilling over the edges of window boxes and other outdoor containers. They are not fussy about soil, require only free air circulation and full sunlight to flower their best."

VERBENA ABRAMSI Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 37: 2455. 1962; Hocking, Excerpt. Bot. A.6: 534. 1963; Moldenke, Biol. Abstr. 45: 6658. 1964; Moldenke, Phytologia 11: 437. 1965.

xVERBENA ADULTERINA Hausskn.

Additional bibliography: Hocking, Excerpt. Bot. A.6: 534. 1963; Moldenke, Phytologia 11: 437. 1965.

VERBENA ALATA Sweet

Additional bibliography: Hocking, Excerpt. Bot. A.6: 534. 1963; Moldenke, Biol. Abstr. 45: 3136. 1964; Moldenke, Phytologia 11: 437. 1965; Rambo, Pesquis. Bot. 21: 31—32 & [59]. 1965.

Rambo (1965) cites Herb. Anchieta 6838 [Bruxel s.n.] and 31459 from Santa Catarina, 1134, 28735 [Emrich s.n.], 29983 [Emrich s.n.], 32302, 35416, 44083, 44585, 44819, 44944, 45639, 46011, 49719, 49760, 52806 [Emrich s.n.], 53933, 53959, 54084, 54634, 54735, 55046, 56353, 56798, 60516 [Sacco s.n.], and 64063 [Sacco 411] from Rio Grande do Sul, and 35956 [Hatschbach 484] from Paraná, Brazil — all collected by himself except where otherwise noted. He describes the plant as "Herbaceous, sparsely branched, very stiff, leaves reduced, habit xerophytic (!), up to 2 m. high", growing in "Swamps, densely vegetated by shrub and tall herbs" in the "Northeastern Lowlands and coastal strip, especially frequent on the northeastern Highlands" of Rio Grande do Sul, with a general distribution "From Minas Gerais to RGS".

Additional citations: BRAZIL: State undetermined: Sellow s.n. [Macbride photos 17399] (W—photo).

VERBENA ALATA f. ALBA Moldenke

Additional bibliography: Moldenke, Phytologia 8: 148—149. 1961; Hocking, Excerpt. Bot. A.6: 534. 1963.

VERBENA AMBROSIFOLIA Rydb.

Additional bibliography: Moldenke, Biol. Abstr. 37: 2455. 1962; Hocking, Excerpt. Bot. A.5: 44 (1962) and A.6: 534. 1963; Moldenke, Phytologia 11: 437—438, 440, 448, 488, 490, & 491. 1965.

The J. Rzedowski 4366, distributed as V. ambrosifolia, is actually V. andrieuxii Schau., E. M. Marsh 2148 and C. M. Rogers 4705 are V. bipinnatifida Nutt., and E. G. Marsh 1188 & 1524 are V. ciliata Benth.

Additional citations: COLORADO: Las Animas Co.: C. M. Rogers 4433 (Mi), 4556 (Mi), 6015 (Mi), 6033 (Mi), 6044 (Mi). OKLAHOMA: Cimarron Co.: C. M. Rogers 2123 (Mi). TEXAS: Brewster Co.: Rose-Innes & Moon 1172 (Ld); B. H. Warnock 20121 (Ld), 20921 (Ld). Pecos Co.: Milliger 63 (Au—223250). NEW MEXICO: Union Co.: C. M. Rogers 5956 (Mi). MEXICO: Coahuila: E. G. Marsh 707, in part (Au), s.n. [Loma Grande] (Au—219481).

VERBENA AMBROSIFOLIA f. EGLANDULOSA Perry
Additional bibliography: Hocking, Excerpt. Bot. A.5: 44. 1962; Moldenke, Phytologia 10: 92 (1964) and 11: 491. 1965.
Additional citations: ARIZONA: Cochise Co.: Deaver 6579 (Ac). MEXICO: Guanajuato: J. Rzedowski 9542 (Ip).

VERBENA AMOENA Paxt.
Additional bibliography: Moldenke, Phytologia 10: 92. 1964.
Recent collectors have found this plant in flower and fruit in June and July.
Additional citations: MEXICO: Federal District: Paray 2928 (Ip). México: Dávila s.n. [23.VI.1963] (Ip). CULTIVATED: India: Khoshoo 1 (Z).

VERBENA ANDRIEUXII Schau.
Additional bibliography: Moldenke, Phytologia 10: 92. 1964.
Rzedowski found this plant growing at the edge of an arroyo at 2250 meters altitude, with purple flowers, in flower and fruit in September. Material has been misidentified and distributed in herbaria as V. ambrosifolia Rydb.
Additional citations: MEXICO: San Luis Potosí: J. Rzedowski 4366 (Ip).

VERBENA ARAUCANA R. A. Phil.
Additional bibliography: Moldenke, Phytologia 11: 438. 1965.
Additional citations: CHILE: Linares: R. A. Philippi s.n. [Linares; Macbride photos 17400] (W--photo). Santiago: Macbride photos 34344 (W--photo).

VERBENA ARENARIA Moldenke
Additional bibliography: Hocking, Excerpt. Bot. A.5: 45. 1962; Moldenke, Phytologia 8: 379. 1962; Moldenke, Biol. Abstr. 37: 1062. 1962.

xVERBENA ARGENTINA Moldenke
Additional bibliography: Moldenke, Biol. Abstr. 37: 1062. 1962; Hocking, Excerpt. Bot. A.5: 45. 1962; Moldenke, Phytologia 10: 93. 1964.

VERBENA ARISTIGERA S. Moore
Additional bibliography: Moldenke, Phytologia 11: 438. 1965.
Additional citations: BRAZIL: Matto Grosso: S. Moore 1083 [Macbride photos 17403] (W--photo of type).

VERBENA ATACAMENSIS Reiche
Additional bibliography: Moldenke, Phytologia 11: 438. 1965.
Recent collectors have found this plant in flower in November and in fruit in October and November. The flowers on Ricardi 2470 are described as having been "white".
Additional citations: CHILE: Antofagasta: Ricardi 2470 (Z), 3569 (Ac). Maule: Pfister s.n. [Termas de Cauquenes, 2-XI-1952]

(Ac).

VERBENA BALANSAE Briq.
Additional bibliography: Moldenke, Phytologia 11: 438. 1965; Rumbo, Pesquis. Bot. 21: 58. 1965.

VERBENA BERTERII (Meisn.) Schau.
Additional bibliography: Moldenke, Phytologia 11: 438—439. 1965; Moldenke, Résumé Suppl. 12: 10. 1965.
Additional citations: CHILE: Colchagua: Bertero 744 [Macbride photos 7853, in part] (W—photo of isotype). Valparaíso: Bertero 1389 [Macbride photos 7853, in part] (W—photo).

VERBENA BIPINNATIFIDA Nutt.
Additional bibliography: Loes., Verh. Bot. Ver. Brand. 53: 75 [Abhandl. 240]. 1912; Brilmayer, All about Vines 350. 1962; Hocking, Excerpt. Bot. A.6: 534. 1963; Moldenke, Phytologia 11: 439—441, 443, 448, 452, 453, 486, 488, 490, & 491. 1965.
The R. L. Crockett 8578 & 8619, cited below, may not actually have been collected in the counties to which they are here cited since their labels read "Johnson City — Kerrville" and "Johnson City — Austin" respectively.
Brilmayer (1962) says of this plant "tender trailing perennial grown as an annual, with ferny leaves and clusters of lilac flowers. Native of some midwestern states." McCart found the species growing on a calcareous bluff of the Fredericksburg Group, Goodland-Comanche Peak Formation. Other collectors have found it in sandy soil and in red sand. Strother found it in sandy soil over limestone of the Cretaceous Eagle Ford Group. The E. G. Marsh 1524, distributed as V. bipinnatifida, is actually V. ciliata Benth.
Additional citations: OKLAHOMA: Cimarron Co.: C. M. Rogers 4705 (Mi). TEXAS: Bee Co.: R. L. Crockett 7965 (Ld). Bexar Co.: Martinez & Garcia 14 (Au—213884); Ugent 1410 (Ld). Dallas Co.: G. Ramirez 39 (Au—235230). Duval Co.: E. G. Garcia 116 (Au—232909); Minerva Martinez 64 (Au—233113). Frio Co.: Painter, Lucas, & Barkley 14225 (Ld). Kerr Co.: R. L. Crockett 8578 (Ld). Kimble Co.: Demaree 48513 (Ac). Kinney Co.: Strother 263 (Ip). McMullen Co.: Alvarez, Guajardo, Salazar, & McCart 7710 (Au—222199); Paez 112 (Au—222197). Tarrant Co.: McCart 6920 (Au—236817). Tom Green Co.: Ballinger s.n. [April 9, 1961] (Au—220923). Travis Co.: R. L. Crockett 8619 (Ld); R. B. Payton 41 (Ld). MEXICO: Coahuila: E. M. Marsh 2148 (Au—213884). Durango: Powell & Edmondson 961 (Mi). México: Paray 1201 (Ip).

VERBENA BIPINNATIFIDA var. LATILOBATA Perry
Additional bibliography: Moldenke, Phytologia 11: 437, 440, 441, & 491. 1965.

xVERBENA BLANCHARDI Moldenke
Additional bibliography: Moldenke, Phytologia 11: 441, 448, & 462. 1965.

VERBENA BONARIENSIS L.
Additional bibliography: Hocking, Excerpt. Bot. A.6: 534. 1963; Moldenke, Phytologia 11: 441--442 & 470 (1965) and 12: 205 & 228. 1965; Moldenke, Résumé Suppl. 12: 1. 1965; Rambo, Pesquis. Bot. 21: 32—34 & [59]. 1965.

Smith & Klein found this species growing on boggy river margins, in gallery forests, and ruderal in Santa Catarina, Brazil. The Pedersen 61144, distributed as V. bonariensis, actually represents var. conglomerata Briq. The R. L. Crockett 8425, cited below, may actually not have been collected in the county from which it is cited since its label reads "Beaumont--Houston Road". The Mendonca 2973, also cited below, is said to match Rand 365 & 1237 from Southern Rhodesia, and Torre 2239 is said to match Schlechter 2334 at the British Museum.

Rambo (1965) cites Herb. Anchieta 34521, 54316 [Reitz 4993], and 61150 [Mattos s.n.] from Santa Catarina and 603, 1132, 3036, 3044, 3931, 8378 [Emrich s.n.], 8990, 9468, 9718, 10037, 10063, 25693, 26266, 28486, 30933, 32965 [Streider s.n.], 35458 [Ritter s.n.], 36412, 37454 [Emrich s.n.], 38179, 38325, 38408, 38916, 38973, 39451, 39812, 40491, 40749, 41074, 41219, 43510, 43906, 44116, 44251, 44272, 44599, 45281, 49696, 50690 [Sehnem 4155], 41003 [Sehnem 5598], 51381, 51444, 53307, 57305, 59120 [Pivetta 983], 59122 [Pivetta 980], 60782 [Sacco 630], 60929 [Camargo 1625], 61150 [Sacco 666], 62709 [Camargo 2363], 63285 [Sacco 705], 63818 [Sacco 39], and 64044 [Sacco 410] from Rio Grande do Sul, Brazil -- all his own collections except where otherwise indicated. He indicates, however, that numbers 35458 & 38408 have otherwise been identified as var. conglomerata Briq., while 41219 has been identified as V. inamoena Briq. He comments that "V. inamoena.....is at best a variety of V. bonariensis L." He describes the species as "Herbaceous, stiff, coarse, sparingly branched, up to 1 m high", growing on "Dry to somewhat moist, bare or more or less vegetated Campos.....Common over the whole of the Campos area" in Rio Grande do Sul, with a general distribution "From southern USA through the whole of tropical and subtropical America, with several varieties."

Additional citations: LOUISIANA: Washington Par.: Demaree 50721 (Ac). TEXAS: Jefferson Co.: R. L. Crockett 8425 (Ld). BRAZIL: Guanabara: M. C. Vianna 23 [Herb. Cent. Pesq. Florest. 1673] (Ac). Rio de Janeiro: Castellanos 24564 [Herb. Cent. Pesq. Florest. 3179] (Ac). Santa Catarina: Smith & Klein 13968 (Ac). ARGENTINA: Buenos Aires: Boffa s.n. [Berisso, XII/1944] (Mi); Hicken s.n. [III.1906] (N); Ruíz Huidobro 1666 (Mi), 1695 (Mi),

1771 (Mi). PORTUGUESE EAST AFRICA: Lourenço Marques: F. A. Mendonca 2973 (Ul); Torre 2239 (Ul), 7248 (Ul).

VERBENA BONARIENSIS var. CONGLOMERATA Briq.

Additional bibliography: Rambo, Pesquis. Bot. 21: 33. 1965; Moldenke, Phytologia 11: 442. 1965.

Pedersen found this plant growing in wet ground.

Additional citations: ARGENTINA: Corrientes: Pedersen 6144 (S).

VERBENA BRACTEATA Lag. & Rodr.

Additional bibliography: Rickett, New Field Book Am. Wild Fls. 280, fig. 98. 1963; Hocking, Excerpt. Bot. A.6: 534. 1963; Sharp & Baker, Castanea 29: 183. 1964; Moldenke, Phytologia 11: 440, 442--445, 448, 462, & 476. 1965; Cody, Ind. Sem. Pl. Res. Inst. Ottawa 1965: 31. 1965.

Additional illustrations: Rickett, New Field Book Am. Wild Fls. fig. 98. 1963.

Sharp & Baker (1964) state that this species "seems restricted to the western tier of counties" in Tennessee, but a glance at my distribution map, published in Phytologia, volume 8 (1962), shows this to be incorrect. Muhlenbach 1525 was originally identified by the collector as "V. simplex x bracteata", but I do not think that it represents a hybrid, at least insofar as can be seen from the specimen cited below.

Additional citations: VERMONT: Chittenden Co.: A. R. Moldenke 1133 (Ac). MASSACHUSETTS: Bristol Co.: W. R. Taylor 29463 (Mi). INDIANA: Saint Joseph Co.: W. W. Lyon Jr. s.n. [June 29, 1930] (Mi). MISSOURI: Saint Louis: Muhlenbach 54 (Ac), 164 (Ac), 312 (Ac), 1525 (Ac), 1625 (Ac). UTAH: Rich Co.: M. E. Jones s.n. [Alta, Aug. 2, 1879] (Mi). NEVADA: Clark Co.: Clokey 8096 (Mi). COLORADO: Las Animas Co.: C. M. Rogers 4435 (Mi), 4536 (Mi). OKLAHOMA: Cimarron Co.: C. M. Rogers 4668 (Mi); Waterfall 3139 (N). TEXAS: Dawson Co.: Lundell & Lundell 16973 (Ld). Ochiltree Co.: Correll & Ogden 28352 (Ld). Sherman Co.: D. S. Correll 30290 (Ld). ARIZONA: Coconino Co.: Deaver 5847 (Ac).

VERBENA BRACTEATA f. ALBIFLORA (Cockerell) Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A.6: 534. 1963; Moldenke, Phytologia 10: 96. 1964.

VERBENA BRASILIENSIS Vell.

Additional bibliography: Hocking, Excerpt. Bot. A.6: 534. 1963; Moldenke, Phytologia 11: 442, 445—446, & 502. 1965; Moldenke, Résumé Suppl. 12: 1. 1965.

Pedersen found this plant growing in sandy rather moist ground formerly plowed and much trampled.

Additional citations: ALABAMA: Shelby Co.: Demaree 50643 (Ac). LOUISIANA: DeSoto Par.: Demaree 50829 (Ac). Plaquemines Par.: Demaree 50745 (Ac). Saint Tammany Par.: Demaree 49994 (Ac), 50769

(Ac). Washington Par.: Demaree 50723 (Ac), 50734 (Ac). BRAZIL: Guanabara: Castellanos 23465 [Herb. Cent. Pesq. Florest. 1741] (Ac), 23599 [Herb. Cent. Pesq. Florest. 2005] (Ac). São Paulo: G. Eiten 1595 (W—2369602). CHILE: Linares: Ricardi 2826 (Ac).

VERBENA CABRERAE Moldenke

Additional synonymy: Verbena cabrera Moldenke ex Hocking, Excerpt. Bot. A.5: 45, sphalm. 1962.

Additional bibliography: Hocking, Excerpt. Bot. A.5: 45. 1962; Moldenke, Phytologia 10: 97. 1964; Moldenke, Résumé Suppl. 12: 12. 1965.

VERBENA CALLIANTHA Briq.

Additional bibliography: Hocking, Excerpt. Bot. A.5: 45. 1962; Moldenke, Phytologia 11: 446. 1965.

VERBENA CAMERONENSIS L. I. Davis

Additional bibliography: Moldenke, Phytologia 11: 446. 1965.

The flowers of this plant are described as "purple" on R. M. King 3983 and J. Rzedowski 7360 and as "lavender" on R. M. King 4249. This same collector describes the plant as "locally abundant along gravel road in partial shade" and as "abundant weeds" in "open sun" in San Luis Potosí, Mexico. Recent collectors have found it in fruit in March and April. Material has been misidentified and distributed in herbaria as V. delticola Small and V. pumila Rydb.

Additional citations: MEXICO: San Luis Potosí: R. M. King 3983 (Mi), 4249 (Mi, W—2365016); J. Rzedowski 7309 (Ip, Ip), 7360 (Ip), 9871 (Ip). Tamaulipas: J. A. de la Cruz s.n. [12.IV. 1961] (Ip).

VERBENA CAMPESTRIS Moldenke

Additional bibliography: Moldenke, Phytologia 11: 446. 1965; Rambo, Pesquis. Bot. 21: 34—35 & [59]. 1965.

Rambo (1965) cites Herb. Anchieta 48312 [Reitz 3348] and 48330 [Reitz 3486] from Santa Catarina, Brazil. He describes the plant as "Prostrate to ascending", growing on "Grassy Campo", and comments that it is "To be expected on the nearby northeastern Highlands" of Rio Grande do Sul, with a general distribution of "So far, SC only".

VERBENA CANADENSIS (L.) Britton

Additional bibliography: Loes., Verh. Bot. Ver. Brand. 53: 75 [Abhandl. 240]. 1912; Hocking, Excerpt. Bot. A.5: 44 (1962) and A.6: 535. 1963; Rickett, New Field Book Am. Wild Fls. 280, fig. 98. 1963; Moldenke, Phytologia 11: 440, 441, 443, 446—450, 453, 455, 485, 486, 488, & 490. 1965.

Additional illustrations: Rickett, New Field Book Am. Wild Fls. fig. 98. 1963.

Additional citations: TEXAS: Chambers Co.: R. L. Crockett 8310

(Ld).

VERBENA CANADENSIS f. CANDIDISSIMA (Haage & Schmidt) Palmer & Steyerm.

Additional bibliography: Moldenke, Phytologia 11: 448 & 450. 1965.

VERBENA CANESCENS H.B.K.

Additional synonymy: Verbena canes H.B.K., in herb.

Additional bibliography: Loes., Verh. Bot. Ver. Brand. 53: 74 [Abhandl. 239]. 1912; H. B. Davis, Life & Works Pringle 21 & 130. 1936; Moldenke, Biol. Abstr. 45: 7026. 1964; Moldenke, Phytologia 11: 450--451, 502, & 503. 1965; Moldenke, Résumé Suppl. 12: 1. 1965.

Dominguez and McCart found this species growing in hard sandy marl silt in Tamaulipas. Graham and Johnston found it at 500 feet altitude in the same state, while Rzedowski encountered it at 2700 meters in San Luis Potosí. The flowers on Rzedowski 4251 are described as "blue-purple", but on Gonzalez Medrano s. n. as "blue". Rzedowski found it growing in abandoned fields.

The R. L. Crockett 8626, cited below as from Blanco County, Texas, may actually have come from Travis County -- its label reads merely "Johnson City--Austin", while 8077, cited from Nuevo León, may actually be from the Federal District, Mexico -- its label reads "Monterrey--Mexico road".

Material has been misidentified and distributed in herbaria under the name V. canes var. roemeriana (Scheele) Perry. On the other hand, the Graham & Johnston 4707 and Strother 264, distributed as V. canescens, are actually var. roemeriana (Scheele) Perry, while Pringle s.n. [Valley, Ortia, Apr. 11, 1887] is V. halei Small. The O. M. Clark 7059, Paxson & Barkley 16M839, and C. L. Smith 221, in part, cited by me in Phytologia 8: 474 (1963) appear to be V. pinetorum Moldenke.

Additional citations: TEXAS: Blanco Co.: R. L. Crockett 8626 (Ld). MEXICO: Nuevo León: R. L. Crockett 8077 (Ld). San Luis Potosí: J. Rzedowski 4251 (Ip), 5278 (Ip), 5401 (Ip), 6165 (Ip), 6347 (Ip), 9571 (Ip). Tamaulipas: Dominguez & McCart 8227 (Au--222208, Au--236267); Gonzalez Medrano s.n. [Rancho El Mezquite, 18.III.1963] (Ip); Graham & Johnston 4707 (Mi).

VERBENA CANESCENS f. ALBIFLORA Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 45: 7026. 1964; Moldenke, Phytologia 11: 451. 1965.

VERBENA CANESCENS var. ROEMERIANA (Scheele) Perry

Additional synonymy: Verbena canes var. roemeriana (Scheele) Perry, in herb.

Additional bibliography: Moldenke, Phytologia 11: 451, 502, & 503. 1965.

Gould found this plant growing "in fertile dark loamy soil on small rocky knoll" in Coahuila, while Salgado encountered it in "sandy soil associated with Larrea, Bouteloua, and Flourencia."

The J. Rzedowski 4251, 5278, 6165, & 6347, originally distributed as this variety, are actually all typical V. canescens H.B.K.

Additional citations: TEXAS: Hidalgo Co.: M. L. Walker 66 (Ld). Kinney Co.: Strother 264 (Ip). MEXICO: Coahuila: Fuentes C. s.n. [20.IX.1959] (Ip); F. W. Gould 10656 (Mi); Salgado s.n. [17.V. 1961] (Ip).

VERBENA CAROLINA L.

Additional bibliography: Hook., Trans. Linn. Soc. Lond. Bot. 20: 195. 1847; Loes., Verh. Bot. Ver. Brand. 53: 74 [Abhandl. 239]. 1912; H. B. Davis, Life & Works Pringle 132. 1936; Moldenke, Biol. Abstr. 36: 4036. 1961; Hocking, Excerpt. Bot. A.5: 44. 1962; Moldenke, Phytologia 11: 451, 501, & 502, 1965.

The flowers are described as "blue" on Breedlove 8677 & 8699. Weber and Charette found the plant growing on steep slopes of barrancas in Durango. Material has been misidentified and distributed in herbaria as V. officinalis L. On the other hand, the Scora & Scora 2452, distributed as V. carolina, is actually V. litoralis H.B.K.

Andersson (1854) speaks of a "Verbena caroliniana var. foliis incisis, laciniis grosse serratis Hook." [Hooker, however (1847), refers to the plant as "V. polystachya var. foliis incisis segmentis grossè serratis"], based on a Darwin collection from James Island, Galapagos. Just what this specimen may be I do not as yet know, as I have not seen the Darwin collection nor any other from that island. The description does not fit well with any of the seven species of the genus known to me from the Galapagos.

Additional citations: MEXICO: Durango: Weber & Charette 11773 (Mi). Federal District: J. Rzedowski 20096 (Ip). México: M. Abarca 13 (Ip); Cota 45 (Ip); Paray 2449 (Ip); J. Rzedowski 15832 (Ip). Sonora: Gentry, Barclay, & Arguelles 19303 (W--2366189). GUATEMALA: Huehuetenango: Breedlove 8677 (Ac), 8699 (Ac).

VERBENA CAROLINA f. ALBIFLORA Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A.5: 44. 1962; Moldenke, Phytologia 10: 101. 1964.

Additional citations: EL SALVADOR: Santa Ana: Tucker 1307 (Mi).

VERBENA CHEITMANIANA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 452 & 469. 1965.

VERBENA CHILENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 11: 452. 1965.

Additional citations: ARGENTINA: Mendoza: R. A. Philippi s.n.

[Mendoza; Herb. Mus. Nac. Hist. Nat. Chile 42446 & 54790; Macbride photos 17417] (W--photo of isotype).

VERBENA CILIATA Benth.

Additional synonymy: Verbena cililata Benth. ex Moldenke, Résumé Suppl. 12: 12, in syn. 1965. Verbena ciliata var. ciliata Wiggins, in herb.

Additional bibliography: Loes., Verh. Bot. Ver. Brand. 53: 75 [Abhandl. 240]. 1912; H. B. Davis, Life & Works Pringle 104. 1936; Moldenke, Résumé Suppl. 12: 1 & 12. 1965; Moldenke, Phytologia 11: 440, 448, 452—453, 490, 491, & 493 (1965) and 13: 181 & 183. 1966.

Johnston found this species growing in pale clay loam at the edge of a field in Coahuila, and Gould found it in gravelly soil of an open field with mesquite cover in Chihuahua. The flowers on S. S. White 2018 are described as "blue", while those on J. Rzedowski 3051 were "purple". The R. L. Crockett 8091 & 8138, cited below, may have been collected in Coahuila or Nuevo León — their labels read "Monterrey—Saltillo Road".

The E. G. Garcia 116, Martinez & Garcia 14, and Paray 1201, distributed as V. ciliata, are actually V. bipinnatifida Nutt.; C. Cantu 69, Claflin 41, Montemayor 31, and Ramirez, Lopez, & Mc Cart 8763 are V. ciliata var. longidentata Perry; Nápoles s.n. [Agosto 1945] is V. elegans H.B.K.; and Wiggins & Wiggins 16073 is V. gooddingii Briq.

Additional citations: ARIZONA: Coconino Co.: Cureton 44 (Ac). MEXICO: Chihuahua: F. W. Gould 8755 (Mi); S. S. White 2018 (Mi). Coahuila: R. L. Crockett 8138 (Ld); M. C. Johnston 2600 (Au—231801, Mi); E. G. Marsh 1188 (Au—212986), 1524 (Au—213393). Federal District: Paray 1211 (Ip). Hidalgo: J. L. Castro 17 (Ip); Galván s.n. [28.VII.1963] (Ip); González Quintero 349 (Ip); J. Rzedowski 16927 (Ip). Nuevo León: Boke & Lent 37 (Ac); R. L. Crockett 8091 (Ld). Puebla: C. Calderón s.n. [19.IV.1964] (Ip). San Luis Potosí: J. Rzedowski 3051 (Ip, Ip), 4344 (Ip), 8801 (Ip). Tlaxcala: Galicia s.n. [27.V.1962] (Ip).

VERBENA CILIATA var. LONGIDENTATA Perry

Additional bibliography: Moldenke, Phytologia 11: 440, 448, 452, 453, 490, & 491. 1965; Moldenke, Résumé Suppl. 12: 1. 1965.

Material of this variety has been misidentified and distributed in herbaria under the misspelled name V. cililata Benth. The species has been found by recent collectors growing in black clay, red or black soil, marl, sandy silt, Pleistocene gravel, and hard-packed dark gray soil. The Flores call it "abundant in red soil". The Minerva Martinez 64, distributed as this variety, is actually V. bipinnatifida Nutt.

Additional citations: TEXAS: Bee Co.: C. Cantu 69 (Au—235231). Dimmit Co.: R. Acosta 80 (Au—232739); Chaves, Flores, & Hein 74

(Au—233121). Duval Co.: R. Acosta 49 (Au—232661); P. Cabrera 56 (Au—233116); Noyola 21 (Au—233118). Hidalgo Co.: R. L. Crockett 8177 (Ld); Gonzalez & Quesada 33 (Au—233114). Jim Hogg Co.: Raquel Bruno 41 (Au—232314). Jim Wells Co.: Rebecca Bruno 38 (Au—232911); Gamboa & Dohnke 151 (Au—233117). LaSalle Co.: Flores & Flores 126 (Au—232912); A. Sanchez 100 (Au—233111). Maverick Co.: T. Bruni 12 (Au—232631). Medina Co.: Barrera & Laurel 110 (Au—232656). Nueces Co.: Claflin 41 (Au—222195). Webb Co.: Cisneros 23 (Au—233108); Ramirez, Lopez, & McCart 8763 (Au—233107). MEXICO: Tamaulipas: Montemayor 31 (Au—235227).

VERBENA CILIATA var. PUBERA (Greene) Perry

Additional bibliography: Moldenke, Phytologia 11: 453, 490, & 491. 1965.

VERBENA CLAVATA Ruíz & Pav.

Additional bibliography: Moldenke, Phytologia 11: 453. 1965.

Additional citations: PERU: Ancash: Weberbauer 2768 [Macbride photos 17416] (W—photo). Arequipa: Meyen s.n. [Pampa Grande; Macbride photos 17409] (W—photo). Huánuco: Ruíz s.n. [Macbride photos 17408] (W—photo of cotype).

VERBENA CLOVERAE Moldenke

Additional synonymy: Verbena cloveri var. eilacina Moldenke, Résumé Suppl. 12: 12, in syn. 1965. Verbena cloveri var. lilaciana Moldenke, Résumé Suppl. 12: 12, in syn. 1965.

Additional bibliography: Moldenke, Phytologia 11: 454 & 502. 1965; Moldenke, Résumé Suppl. 12: 2 & 12. 1965.

The flowers are described as "blue" on B. L. Turner 4978 and "purple" on Alvarez, Guajardo, Salazar, & McCart 7783. The species has been found in fruit also in February and November and in flower in November. Recent collectors have found it growing in sand, red loam, sand with small gravel, deep sandy soil, hard sandy marl silt, orange-colored sandy loam, loose reddish-orange sand, loose or very loose light-tan sand, and deep orange-colored loose sand. The Flores call it "abundant" in red sand.

Additional citations: TEXAS: Atascosa Co.: B. L. Turner 4978 (Au—229140). Brooks Co.: Painter & Barkley 14315 (Ld). Dimmit Co.: Dickey 61 (Au—233352). Duval Co.: Alvarez, Guajardo, Salazar, & McCart 7657 (Au—222268, Au—222269). Frio Co.: Painter, Lucas, & Barkley 14230 (Ld). Jim Hogg Co.: Alvarez, Guajardo, Salazar, & McCart 7783 (Au—222267); Rebecca Bruno 41 (Au—232671); P. Cabrera 57 (Au—232672). LaSalle Co.: Alvarez, Guajardo, Salazar, & McCart 7614 (Au—222263); Flores & Flores 127 (Au—222469); A. Sanchez 111 (Au—233431); M. de J. Solis 122 (Au—233351). Starr Co.: R. Acosta 74 (Au—233430); P. Cabrera 85 (Au—233428). Webb Co.: Soto, Herrera, & McCart 8100 (Au—

222264). Zapata Co.: Raquel Bruno 31 (Au—232753); Ramos, Sandoval, Salazar, & McCart 7846 (Au—222266); A. Sanchez 87 (Au—233106); M. de J. Solis 79 (Au—232467). MEXICO: Tamaulipas: Dominguez M. & McCart 8232 (Au—222270).

VERBENA CORYMBOSA Ruíz & Pav.

Additional bibliography: Moldenke, Phytologia 11: 454. 1965; Rambo, Pesquis. Bot. 21: 35 & [59]. 1965.

Smith & Klein found this species growing ruderal, in dry fields, forests, gallery forests, and by small rivers in Santa Catarina, Brazil.

Rambo (1965) cites Herb. Anchieta 50793 [Reitz 3770] & 54307 [Reitz 4970] from Santa Catarina and 34724 & 50505 from Rio Grande do Sul, the two latter being his own collections. He describes the plant as "Erect, vigorous, abundantly branched, leafy, up to 1 m high", growing in "Rather moist places, densely vegetated" in the "Northeastern Highlands only" in Rio Grande do Sul, with a general distribution of "Peru, Chile, Uruguay, RGS, SC."

Additional citations: BRAZIL: Santa Catarina: Smith & Klein 12998 (Ac), 13026 (W—2451610), 13460 (Ac).

VERBENA CUMINGII Moldenke

Additional bibliography: Moldenke, Phytologia 9: 202. 1963.

The species has been collected in flower in October.

Additional citations: CHILE: Coquimbo: Marticorena & Matthei 340 (Z).

VERBENA CUNEIFOLIA Ruíz & Pav.

Additional bibliography: Moldenke, Phytologia 11: 454 & 484. 1965.

Saunders describes this plant as very free-flowering, to four feet tall, with a strong sweet scent and bluish-white flowers.

Additional citations: PERU: Lima: S. G. E. Saunders 631 (Mi). Department undetermined: Dombey s.n. [Macbride photos 17411] (W—photo).

xVERBENA DEAMII Moldenke

Additional bibliography: Moldenke, Phytologia 11: 448, 454—455, & 462. 1965.

VERBENA DELTICOLA Small

Additional bibliography: Moldenke, Phytologia 11: 448 & 455. 1965.

The R. L. Crockett 8043, cited below, is inscribed "Mercedes—Monterrey Road", so the exact locality of collection is not known. The species has been found by recent collectors in gravel and on unwooded sandy hillsides. Rzedowski 7101 was encountered at 2750 meters altitude and had "purple" flowers.

Material has been misidentified and distributed in herbaria as V. tumidula Perry. The Rzedowski 7309 & 7360, distributed as V.

delticola, are actually V. cameronensis L. I. Davis.

Additional citations: TEXAS: Hidalgo Co.: R. L. Crockett 820 (Ld), 867 (Ld, Ld), 869 (Ld), 8185 (Ld). MEXICO: Coahuila: E. G. Marsh 1822 (Au—219621). Durango: Paray 3243 (Ip). Nuevo León: R. L. Crockett 8043 (Ld); Diaz Luna s.n. [16.IX.1959] (Ip); Dominguez M. & McCart 8271 (Au—222190); J. N. Weaver 10333 (Au—236911). San Luis Potosí: Paray 565 (Ip); J. Rzedowski 7101 (Ip), 10026 (Ip).

VERBENA DISSECTA Willd.

Additional bibliography: Troncoso, Darwiniana 13: 468, 470, & 484—485. 1964; Moldenke, Phytologia 11: 455. 1965; Moldenke, Résumé Suppl. 12: 5. 1965; Rambo, Resquis. Bot. 21: 35—37 & [59]. 1965.

Cabrera 10792 is said to have had "rose" flowers.

Rambo (1965) cites Herb. Anchieta 449, 1837, 3034, 3038, 3043, 3939, 4242, 4317, 4362, 4772, 6624, 8486, 8587, 8890, 9165, 27686 [Henz s.n.], 28817 [Gonçalves s.n.], 29591 [Henz s.n.], 30935, 32179, 32328, 32939 [Friderichs s.n.], 34488 [Augusto s.n.], 35629 [Henz s.n.], 35915 [Emrich s.n.], 36414, 42959, 43778, 44104, 48074 [Sehnem 3466], 48478 [Sehnem 2128], 51378, 51652, 56208, 56225, 61723 [Camargo 2567], 62124 [Camargo 2022], 62518 [Camargo 2126], & 62995 [Schlichting s.n.] from Rio Grande do Sul, and 54316 [Reitz 4993] from Santa Catarina, Brazil — all collected by himself except where otherwise indicated. He says that the plant is "Prostrate to ascending, branches abundant, densely matted, rooting at the lower joints, up to 40 cm long", growing in "More or less wet places, preferably sandy meadows and rocky outcrops.....Over the whole of the Campos area, especially on the northeastern Highlands" in Rio Grande do Sul, with a general distribution "From S. Paulo to Uruguay and central Argentina to Patagonia".

Troncoso (1964) says: "Gl. dissecta ha sido citada originariamente de Chile en base a material de Luis Née, recogido a fines del siglo XVIII, durante la expedición Malaspina. Todas las citas posteriores para Chile son referidas a la recolección de Née. Moldenke en su monografía del género Verbena.....la cita de Brasil, Bolivia, Uruguay y Argentina, pero no de Chile. Todo el material estudiado por mí señala un área limitada a Buenos Aires, Uruguay y sul de Brasil. Es muy probable pues, que como en otros casos ya verificados, el ejemplar de Née, supuesto de Chile, haya sufrido un error de etiqueta y corresponda a Argentina o Uruguay. Née efectuó herborizaciones en Montevideo y cruzó por tierra desde Mendoza hasta Buenos Aires (Colmeiro, La Botánica y los botánicos de la Peninsula hispano-lusitana: 183. 1858)....Verbena pulchella f. latilobata.....basada en un solo ejemplar de Montevideo, Uruguay (Berro 4751), presenta más similitud con Gl. dissecta que con Gl. pulchella, debiendo incluirse en la primera.

Difiere notablemente de Gl. pulchella, no sólo por la forma y el tamaño de los segmentos foliares (de 3—7 mm lat. y ápice obtuso), sino por sus caracteres florales y tipo de pubescencia. El tamaño de la flor, del cáliz y de sus dientes, el tamaño y forma de las bracteas, la pubescencia del pelitos extendidos, no aplicados (no estrigosos) son caracteres coincidentes con Gl. dissecta. El ejemplar tipo de la f. latilobata, que me fue facilitado por el New York Botanical Garden, se diferencia sin embargo de Gl. dissecta típica por las lacinias foliares más obtusas, la inflorescencia menos ramificada y la pubescencia más rala. Considero que esta diferencias pueden aceptarse como variaciones normales dentro de la especie." She cites from Brazil Tweedie s.n. [Herb. Hooker] (K), from Uruguay Herter 96556 (Si), Fruchard s.n. [Punta Brava, VII.1876] (P), Commerson s.n. [Montevideo V-1767] (P), and Berro 4751 (N), and from Buenos Aires, Argentina, Nicora 543 (Si), Rodrigo 2339 (Si), Martinez Crovetto 443 (Si), and Boelcke 6342 (Si).

Thanks to the recent very splendid revision of certain Argentine species of this complex by Troncoso (1964), quoted above, the specimens cited by me under V. dissecta in previous installments of these notes should be re-examined. The New York Botanical Garden specimens of Rodrigo 2339 and Herter 96556 — collections which she cites as V. dissecta — are most definitely V. pulchella Sweet. On the other hand, the O'Donell 4600, cited by me as V. dissecta, seems to be better placed as V. microphylla H.B.K.; Herb. Inst. Miguel Lillo 31745, Herb. Osten 10676, and Jörgensen 1613 & s.n. [26.III.917] are V. parodii (Covas & Schnack) Moldenke; Villafañe 524 is V. pogostoma Klotzsch; Boffa 330, T. Meyer 12290, and Rambo 48914 are V. pulchella Sweet; Chicchi 264, in part, Gallinal, Aragone, Bergalli, Campal, & Rosengurtt 1433 & 1821, Herb. Herter 50882, Herb. Jussieu s.n., and Rosengurtt B. 2116 are V. selloi Spreng.; Rambo 10103 and Rosengurtt PE.5262 are V. subincana (Troncoso) Shinners; and Herb. Inst. Miguel Lillo 32759, Moreno s.n. [Patagon. 1882/4], Schreiter 1904, Tweedie s.n., and Wilkes Exped. s.n. are V. tenera Spreng.

The Venturi 10301, originally distributed as V. dissecta is V. perakii (Covas & Schnack) Moldenke; Legrand 2717 is V. selloi Spreng.; and Brade 7000, Gallinal, Aragone, Bergalli, Campal, & Rosengurtt PE.5262, Herb. Com. Geogr. & Geol. 3685, Herb. Inst. Bot. S. Paulo 6728 & 15725, Löfgren s.n. [22-9-1887], and Rosengurtt B.3756 are V. subincana (Troncoso) Shinners.

It is very probable that most of the Uruguayan material which I have cited previously as V. dissecta will prove to be V. selloi. The Berro 4751, however, which Troncoso regards as V. dissecta, seems to me to be far closer in its overall characters to V. pulchella and so I continue to regard it as V. pulchella var. lati-

lobata Moldenke.

The Frenguelli 105 & 137, cited below, were erroneously cited by me previously as V. pulchella, while the Boffa 25 and Commerson s.n. were previously cited by me as V. tenera.

Additional citations: BOLIVIA: Province undetermined: Kuntze s.n. [Macbride photos 17424] (W—photo). URUGUAY: Commerson s.n. [Macbride photos 39502, in part] (W—photo). CHILE: Province undetermined: Née s.n. [Herb. Willdenow 11139; Macbride photos 17460] (W—photo of type). ARGENTINA: Buenos Aires: Boffa 25 (N); Commerson s.n. [Buenos Ayres et Monte Video] (N), s.n. [Macbride photos 39502, in part] (W—photo). Entre Ríos: Cabrera 10792 (W—2370642). Santiago del Estero: Frenguelli 105 (N), 137 (N).

VERBENA DISSECTA f. ALBA Moldenke

Additional bibliography: Moldenke, Phytologia 9: 75. 1963.

The Herter 1805 [Herb. Herter 96556], cited by me in previous installments of this work as V. dissecta f. alba, seems definitely to represent typical V. pulchella Sweet instead.

VERBENA DUSENII Moldenke

Additional bibliography: Moldenke, Phytologia 10: 104. 1964.

Additional citations: BRAZIL: Paraná: Saito & Pereira 469/66 (Ac).

VERBENA EHRENBERGIANA Schau.

Additional bibliography: H. B. Davis, Life & Works Pringle 49. 1936; Moldenke, Phytologia 11: 455—456 & 502. 1965.

J. Rzedowski 5324 & 8058 are said to have had "purple" flowers and were collected along roadsides, blooming in September and November.

Additional citations: MEXICO: San Luis Potosí: J. Rzedowski 5324 (Ip), 8058 (Ip).

VERBENA ELEGANS H.B.K.

Additional bibliography: H. B. Davis, Life & Works Pringle 169. 1936; Moldenke, Phytologia 11: 456 & 491 (1965) and 13: 189. 1966.

Rzedowski found this plant growing in Abies religiosa and Juniperus deppeana woods. The Paray 565 and J. Rzedowski 7101 & 10026, originally distributed as V. elegans, are actually V. delticola Small.

Additional citations: MEXICO: Hidalgo: González Quintero 317 (Ip, Ip); Riviello s.n. [Marzo 1946] (Ip); J. Rzedowski 17002 (Ip), 18192 (Ip). Nuevo León: Manning & Manning 53254 (Au—234374). San Luis Potosí: J. Rzedowski 8130 (Ip). Tamaulipas: Martin & Sarabia 1181 (Ip). Vera Cruz: Nápoles s.n. [Agosto 1945] (Ip).

VERBENA ELEGANS var. ASPERATA Perry

Additional bibliography: Moldenke, Phytologia 11: 456 & 491. 1965.

The Paray 3243, distributed as V. elegans var. asperata, is actually V. delticola Small, while Martin & Sarabia 1181 and J. Rzedowski 8130 are typical V. elegans H.B.K.

Additional citations: MEXICO: Coahuila: Fuentes C. s.n. [20.IX. 1959] (Ip). Federal District: Lagúnez 55 (Ip). San Luis Potosí: J. Rzedowski 8817 (Ip), 9685 (Ip). Tamaulipas: R. M. King 4513 (Mi).

xVERBENA ENGELMANNII Moldenke

Additional bibliography: Moldenke, Phytologia 11: 456—457 & 467. 1965; Moldenke, Résumé Suppl. 12: 12. 1965.

One of the A. R. Moldenke 821 specimens cited by me previously as in my personal herbarium is now in the herbarium of Aarhus University.

VERBENA EPHEDROIDES Cham.

Additional bibliography: Moldenke, Phytologia 11: 457 & 481. 1965; Rambo, Pesquis. Bot. 21: 37 & [59]. 1965.

The Eyerdam 10073, originally distributed as V. ephedroides, is actually Diostea scoparia (Gill. & Hook.) Moldenke.

Rambo (1965) cites Herb. Anchieta 30934 from Rio Grande do Sul, Brazil, collected by himself. He says of this plant "Habit: Exactly the same as V. alata Cham.; I cannot see any reasonable difference between the two species." He gives its habitat as "Densely vegetated swamps" in the "Northeastern Highlands (in company of V. alata (!)" and the general distribution as "From Minas Gerais to Uruguay and Misiones."

Additional citations: BRAZIL: São Paulo: N. Santos 5743 [239-17] (Ja). State undetermined: Sellow s.n. [Brasilia meridionali; Macbride photos 17415] (W—photo of type).

xVERBENA FECUNDA Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 33: 1215. 1959; Hocking, Excerpt. Bot. A.5: 44. 1962; Moldenke, Phytologia 10: 106. 1964.

xVERBENA FERAX Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 33: 1215. 1959; Hocking, Excerpt. Bot. A.5: 44. 1962; Moldenke, Phytologia 11: 457. 1965.

VERBENA FILICAULIS Schau.

Additional bibliography: Moldenke, Phytologia 11: 458. 1965; Rambo, Pesquis. Bot. 21: 37—38 & [59]. 1965.

Smith and his associates found this species ruderal in dry open flats bt roads, in campos, low woods, low pastured woods, and on

rock outcrops in Santa Catarina. Rambo (1965) dates Mart., Fl. Bras. 9: 192 as "1951" instead of "1851", and cites Herb. Anchieta 2526, 4825, 8955, 11550 [Buck s.n.], 11579 [Buck s.n.], 30974, 36413, 51000 [Sehnem 5131], 54571, 54642, 56373, 59237, and 62898 [Camargo 3118] from Rio Grande do Sul, Brazil, all collected by himself except where otherwise indicated. He describes the plant as "Weak erect, herbaceous, up to 20 cm high", growing in "Moist places in grassy Campos", and notes that "All collections from the northeastern Highlands" of Rio Grande do Sul, with a general distribution "From Minas Gerais to RGS and Misiones".

Additional citations: BRAZIL: Minas Gerais: Sellow 20 [Macbride photos 17439] (W—photo). Santa Catarina: Smith & Klein 13333 (Ac), 13390 (Ac), 13740 (Ac, Ac), 13870 (Ac); Smith & Reitz 12482 (Ac), 12831 (Ac), 14370 (Ac).

VERBENA GLANDULIFERA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 458. 1965.

Additional citations: ARGENTINA: Santiago del Estero: Pierotti "h" [Tazana, 3/IV/44; Herb. Inst. Miguel Lillo 99460] (Mi).

VERBENA GLUTINOSA Kuntze

Additional bibliography: Moldenke, Phytologia 11: 458. 1965.

Additional citations: ARGENTINA: Mendoza: Kuntze 2 [Macbride photos 17418] (W—photo of isotype).

xVERBENA GONZALEZI Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A.6: 535. 1963; Moldenke, Phytologia 11: 458. 1965.

VERBENA GOODDINGII Briq.

Additional bibliography: Moldenke, Phytologia 11: 458—459, 490, & 491 (1965) and 13: 189. 1966.

Material of this species has been misidentified and distributed in herbaria as "V. ciliata var. ciliata". On the other hand, the R. L. Crockett 820, 867, 869, & 8185, distributed as V. gooddingii, are actually V. delticola Small.

Additional citations: ARIZONA: Coconino Co.: Cureton 21 (Ac); Deaver 5822 (Ac); K. Greenwell 12 (Ac); P. Vogt 21 (Ac). Mohave Co.: Deaver 6135, in part (Ac); Eley 37 (Ac). Yavapai Co.: G. M. Gerrard 84 (Ac). MEXICO: Baja California: Wiggins & Wiggins 16073 (Mi).

VERBENA GOODDINGII var. NEPETIFOLIA Tidestr.

Additional bibliography: Moldenke, Phytologia 11: 459 & 491. 1965.

Straw & Forman found this plant growing on nearly barren grazed hillsides and washes in sandy-clay stony soil, and describe the corollas as "near deep purplish-pink, 2.5 RP 6/10 in the Munsell system per Nickerson color fan".

Additional citations: ARIZONA: Coconino Co.: R. Pardy 32 (Ac). Mohave Co.: Deaver 6135, in part (Ac). Pima Co.: Hess & Procter s.n. [September 5, 1938] (Z). MEXICO: Chihuahua: Straw & Forman 1614 (Mi).

xVERBENA GOODMANI Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 33: 1215. 1959; Hocking, Excerpt. Bot. A.5: 44. 1962; Moldenke, Phytologia 11: 459. 1965.

VERBENA GRACILESCENS (Cham.) Herter

Additional bibliography: Moldenke, Phytologia 11: 459. 1965; Rambo, Pesquis. Bot. 21: 38 & [60]. 1965.

Rambo (1965) cites Herb. Anchieta 4152, 9176, 30975, 32310, and 59154 [Pivetta 966] from Rio Grande do Sul, and 54326 [Reitz 5006] from Santa Catarina, Brazil — all collected by himself except where otherwise noted. He describes the plant as "Slender, herbaceous up to 50 cm high", growing on "Dry Campos.....Widely scattered: SW and NEH" in Rio Grande do Sul, with a general distribution "From S. Paulo to Uruguay; Paraguay to Patagonia".

Additional citations: ARGENTINA: Corrientes: Lossen 466 (G).

VERBENA GRACILIS Desf.

Additional bibliography: H. B. Davis, Life & Works Pringle 152. 1936; Moldenke, Phytologia 11: 459. 1965.

Gould found this plant growing in open pastures along a moist draw in Chihuahua. The flowers are described as "purple" on J. Rzedowski 3338, 20082, & 20219.

Additional citations: MEXICO: Chihuahua: F. W. Gould 8741 (Mi). Federal District: J. Rzedowski 20082 (Ip). México: J. Rzedowski 20219 (Ip). San Luis Potosí: J. Rzedowski 3338 (Ip), 3848 (Ip), 7995 (Ip).

VERBENA GYNOBASIS Wedd.

Additional bibliography: Moldenke, Phytologia 11: 459. 1965.

Recent collectors have found this plant growing at 2100 to 3450 meters altitude, flowering from February to April and in September, fruiting in February and September.

Additional citations: CHILE: Tarapacá: Marticorena, Matthei, & Quezada 42 (Ac); R. A. Philippi s.n. [Sibaya; Macbride photos 17419] (W—photo); Ricardi & Marticorena 4713/1098 (Ac); Ricardi, Marticorena, & Matthei 48 (Ac), 174 (Ac), 387 (Z).

VERBENA HALEI Small

Additional bibliography: Moldenke, Résumé Suppl. 12: 1. 1965; Moldenke, Phytologia 11: 459—460, 475, 501, & 502 (1965) and 13: 187. 1966.

Recent collectors have found this species growing in loose gravel, sandy or loose red silt, dark or black soil, red-brown or

black clay, red or brick-red loose sand, deep orange-colored loose sand, light tan clay, very pale tan loam, hard sandy marl-silt, loose tannish-orange soil, and sandy red soil in thick brush, and in wet places at water's edge. Turner found it growing along with V. cloverae Moldenke in Frio County.

The R. M. King 4294, originally distributed as V. halei, is actually Centrostachys aspera (L.) Standl. in the Amaranthaceae. Muhlenbachs 1423 was identified by the collector as "V. simplex x urticifolia", but I do not think that it is a hybrid. On Parks, Warnock, & Turner 254 the flowers are described as "small yellow".

Additional citations: MISSISSIPPI: Forrest Co.: R. L. Crockett 8671 (Ld). LOUISIANA: Cameron Par.: R. L. Crockett 8398 (Ld). TEXAS: Aransas Co.: D. S. Correll 28920 (Ld). Bastrop Co.: B. Rodriguez 72 (Au—222261). Bexar Co.: Chavez, Flores, & Hein 96 (Au—233422). Brooks Co.: Diana Rodriguez 40 (Au—233350); Vela 12 (Au—233357). Callahan Co.: N. C. Henderson 63-197 (Au—222156). Comanche Co.: N. C. Henderson 63-600 (Au—227282). Dallas Co.: O. Sanders s.n. [Irving, July 14, 1940] (Ld). DeWitt Co.: Blanch 17 (Au—222252). Dimmit Co.: R. Acosta 81 (Au—233359); Alvarez, Guajardo, Salazar, & McCart 7619 (Au—222265); Chavez, Flores, & Hein 76 (Au—233418); Fowler & Vargara 112 (Au-232648); H. Torres 76 (Au—235232). Duval Co.: Alvarez, Guajardo, Salazar, & McCart 7671 (Au—222254); Flores, Chavez, & Hein 43 (Au—233425); Gamboa & Dohnke 130 (Au—232668); R. Garza 47 (Au—222253); A. Trevino 5 (Au—222260, Ip). Fayette Co.: Ripple 51-579 (Au—226884). Frio Co.: Painter, Lucas, & Barkley 14226 (Ld); B. L. Turner 4990 (Au—229409). Gonzales Co.: M. de la L. Hernandez 58 (Au—222250). Hardin Co.: R. L. Crockett 1157 (Ld). Hidalgo Co.: Painter & Barkley 14428 (Ld). Jim Wells Co.: P. Cabrera 101 (Au—233347); Gamboa & Dohnke 140 (Au—233421). Jones Co.: N. C. Henderson 63-170 (Au—225857). LaSalle Co.: Botello 48 (Au—222257); Winch 8 (Au—222259). Lavaca Co.: Strother 185 (Ip). McMullen Co.: Alvarez, Guajardo, Salazar, & McCart 7624 (Au—222256); Minerva Martinez 70 (Au—233356). Sabine Co.: Demaree 47384 (Ac), 50807 (Ac). San Patricio Co.: R. L. Crockett 8226 (Ld, Ld). Starr Co.: M. de J. Solis 149 (Au—233419). Taylor Co.: N. C. Henderson 63-387 (Au—225798). Val Verde Co.: Parks, Warnock, & Turner 254 (Mi). Webb Co.: Cisneros 24 (Au—233345); B. Gutierrez 37 (Au—233346); Soto, Herrera, & McCart 8101 (Au—222262). Zapata Co.: Guerra 40 (Au—232633). High Island: E. L. Crockett 8356 (Ld). Mustang Island: B. H. Warnock 20999 (Ld). MEXICO: Chihuahua: Pringle s.n. [Valley, Ortiz, Apr. 11, 1887] (Mi). Tamaulipas: Carazos 50 (Au—235228); Domínguez M. & McCart 8183 (Ip), 8249 (Au—222258); M. Leal 72 (Au—222251, Ip); Paulita Martinez 60 (Au—233420); Reséndez 9 (Au—

222248); Zertuche 36 (Au—222255).

VERBENA HASSLERANA Briq.

Additional bibliography: Moldenke, Biol. Abstr. 33: 1215. 1959; Hocking, Excerpt. Bot. A.5: 44. 1962; Moldenke, Phytologia 11: 460. 1965.

Additional citations: PARAGUAY: Hassler 6464 [Macbride photos 24685] (Mi—cotype, W—photo of cotype).

VERBENA HASSLERANA var. OVATIFOLIA Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 33: 1215. 1959; Hocking, Excerpt. Bot. A.5: 44. 1963; Moldenke, Phytologia 9: 178—179. 1963.

VERBENA HASTATA L.

Emended synonymy: Verbena lanceolata Boldo ex Moldenke, Alph. List Invalid Names Suppl. 1: 25, in syn. 1947 [not V. lanceolata Beck, 1828, nor Willd., 1825].

Additional bibliography: Deitschman & Pruett, Proc. 17th N. Cent. Weed Control Conf. 1960; Deitschman & Pruett, Weed Abstr. 11 (3): 211. 1962; Rickett, New Field Book Am. Wild Fls. 280, pl. 12. 1963; Moldenke, Biol. Abstr. 45: 3136. 1964; Moldenke, Phytologia 11: 441, 443, 455, 460—466, 471, 476, 486, 488, & 490. 1965; Cody, Ind. Sem. Pl. Res. Inst. Ottawa 1965: 31. 1965; Moldenke, Biol. Abstr. 46: 3616. 1965; Moldenke, Résumé Suppl. 12: 1. 1965; L. M. Reid, Park Management Serv. Bull. 5: 5 & 48. n.d.

Additional illustrations: Rickett, New Field Book Am. Wild Fls. pl. 12. 1963.

Deitschman & Pruett (1960) report eradicating this plant by use of 2,4D and cultivating between rows of Pinus, Juglans, and Populus. MacKeever reports this his no. MV.400 had very open spikes with dark-blue flowers, while MV.402a, found at the edge of a brackish marsh, had the flower-spikes dense at the apex and the corollas purple.

The M. E. Jones 1487, distributed originally as V. hastata, is actually var. scabra Moldenke, while Heidenreich 292 [7138] is xV. rydbergii Moldenke.

Additional citations: MAINE: Franklin Co.: A. R. Moldenke 1125 (Ac). Somerset Co.: A. R. Moldenke 1124 (Ac). NEW HAMPSHIRE: Carroll Co.: A. R. Moldenke 1127 (Ac). Merrimack Co.: A. R. Moldenke 1129 (Ac). VERMONT: Bennington Co.: A. R. Moldenke 1135 (Ac). Chittenden Co.: A. R. Moldenke 1138 (Ac). Essex Co.: A. R. Moldenke 1134 (Ac). Franklin Co.: A. R. Moldenke 1080 (Ac). Lamoille Co.: A. R. Moldenke 1077 (Ac), 1139 (Ac). Orleans Co.: A. R. Moldenke 1136 (Ac). Rutland Co.: A. R. Moldenke 1137 (Ac). Washington Co.: A. R. Moldenke 1076 (Ac). Windsor Co.: A. R. Moldenke 1131 (Ac). MASSACHUSETTS: Martha's Vineyard: MacKeever MV. 402 (N), 402a (N). NEW YORK: Saratoga Co.: H. N. Moldenke 22640 (Ac). Tompkins Co.: Niederhausen s.n. [Slaterville, 7/8/39] (Ip).

Washington Co.: A. R. Moldenke 1071 (Ac). INDIANA: Porter Co.: M. W. Lyon Jr. s.n. [Mineral Springs, VIII.3.1924] (Mi). KENTUCKY: Bath Co.: Plymale s.n. [July 16, 1939] (Mi). Powell Co.: F. T. McFarland 4410 (Mi). MISSOURI: Saint Louis: Muhlenbachs 1035 (Ac), 1307 (Ac), 2402 (Ac). COLORADO: Las Animas Co.: C. M. Rogers 4981 (Mi).

VERBENA HASTATA f. CAERULEA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 465. 1965; Moldenke, Biol. Abstr. 46: 3616. 1965.

It is very possible that MacKeever MV.400, cited previously under V. hastata, represents this form since the collector notes that its flowers were "dark-blue" rather than purple.

VERBENA HASTATA f. ROSEA Cheney

Additional bibliography: Moldenke, Phytologia 11: 465—466. 1965; Moldenke, Résumé Suppl. 12: 1. 1965.

VERBENA HASTATA var. SCABRA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 462 & 466. 1965.

Additional citations: UTAH: Utah Co.: M. E. Jones 1487 (Mi). TEXAS: Hemphill Co.: Correll & Correll 30034 (Ld).

VERBENA HAYEKII Moldenke

Additional bibliography: Moldenke, Phytologia 11: 466. 1965.

Additional citations: PERU: Junín: Weberbauer 2573 [Macbride photos 17442] (W—photo of type).

VERBENA HERTERI Moldenke

Additional bibliography: Moldenke, Phytologia 9: 286—288. 1963; Rambo, Pesquis Bot. 21: 38 & [60]. 1965.

Smith & Reitz encountered this plant on campos along boggy brooks at 1400 meters altitude in Santa Catarina, Brazil. Rambo (1965) cites his collection in Herb. Anchieta 26125 from Rio Grande do Sul and describes the plant as "Prostrate, rooting at the lower joints", growing on "Dry, grassy Campos" on the "Southwestern plains only" in that state, with a general distribution of "RGS and Uruguay".

Additional citations: BRAZIL: Santa Catarina: Smith & Reitz 14204 (Z).

VERBENA HIRTA Spreng.

Additional bibliography: Moldenke, Phytologia 11: 466. 1965; Rambo, Pesquis. Bot. 21: 38—39, 54, & [60]. 1965.

Rambo (1965) cites Herb. Anchieta 6614, 30456 [Reitz 1043], 32227, 36421, 45518, 54061, 54594, & 56783 from Rio Grande do Sul and 36896 [Hatschbach 599] from Paraná, Brazil -- all collected by himself except where otherwise indicated. He admits, however, that no. 36421 has been identified as var. gracilis

Dusén. He describes the species as a "Small shrub, up to 30 cm high, more or less hairy", growing "In more or less moist, grassy Campos" in the "Northeastern Highlands only" in Rio Grande do Sul, with a general distribution "From Bahia to RGS and Misiones".

Additional citations: BRAZIL: Minas Gerais: N. Santos 5704 (Ja). Paraná: Dombrowski, Saito, & Pereira 808/598/192 (Ac); Reiss 16a (Mi); Smith & Klein 14936 (Ac); Smith, Klein, & Hatschbach 14562 (W--2451599). Santa Catarina: Smith & Klein 13024 (Ac), 13733 (W--2451607), 13885 (Ac). São Paulo: Leite 3373 (G). CULTIVATED: Germany: Otto s.n. [Macbride photos 17420] (W--photo).

VERBENA HIRTA var. GRACILIS Dusén

Additional bibliography: Moldenke, Phytologia 10: 110. 1964; Rambo, Pesquis. Bot. 21: 39. 1965.

Smith and his associates encountered this plant in gallery forests and bogs, as well as on dry sunny banks, flowering fruiting in December. The altitude given on the label of one of the Smith & Klein collections is "12000 m.", obviously a typographic error for "1200 m."

Additional citations: BRAZIL: Paraná: Dombrowski 1252 [Herb. Inst.Def. Pat. Nat. 9446] (Ac), 1356 [Herb. Inst. Def. Pat. Nat. 9444] (Ac); Dombrowski, Saito, & Pereira 946/770/289 (Ac). Santa Catarina: Smith & Klein 13394 (W--2451609), 13554 (Ac).

VERBENA HISPIDA Ruíz & Pav.

Additional bibliography: Moldenke, Phytologia 11: 466 & 484. 1965.

Additional citations: PERU: Huánuco: H. Ruíz 1/34 [Macbride photos 29686] (W--photo of type), s.n. [Peruvia et Chili; Macbride photos 17555] (W--photo of isotype). CHILE: Tarapacá: Pfister s.n. [Termas de Mamiña, 12-I-1950] (Ac).

VERBENA HOOKERIANA (Covas & Schnack) Moldenke

Additional bibliography: Moldenke, Phytologia 11: 466. 1965.

The Chicchi 264 collection is a mixture of this species and V. selloi Spreng., not V. dissecta as stated by me previously.

Additional citations: ARGENTINA: La Rioja: G. Dawson 3363 (Ip).

VERBENA HUMIFUSA Cham.

Additional bibliography: Moldenke, Phytologia 11: 466. 1965; Rambo, Pesquis. Bot. 21: 39, 58, & [60]. 1965.

Rambo (1965) cites Herb. Anchieta 30633, 32545 [Henz s.n.], 43261, 43845, 48804, 48911, 48914, 49013, 51272 [Emrich s.n.], 51273, & 57297 from Rio Grande do Sul, Brazil -- all collected by himself except where otherwise noted. He describes the plant as "Vigorous, prostrate, branches from a rootstock, up to 40 cm long", growing in "Dry, grassy Campos". He notes "All collections from the northeastern Lowlands and sea coast in that state, and

gives the general distribution as "From Paraguay and Paraná to RGS and Uruguay".

Additional citations: BRAZIL: State undetermined: Sellow s.n. [Campos de Brasil meridional; Macbride photos 17421] (W--photo of cotype).

xVERBENA HYBRIDA Voss

Additional synonymy: Verbena hybrida L. apud Rambo, Pesquis. Bot. 21: 58, sphalm. 1965.

Additional bibliography: Brilmayer, All About Vines 350. 1962; A. Webster, Carib. Gard. 18, 76, 129, & 138. 1964; Altman & Dittmer, Biol. Data Book 494. 1964; Moldenke, Biol. Abstr. 45: 5377. 1964; Moldenke, Phytologia 11: 456 & 466--467. 1965; Rambo, Pesquis. Bot. 21: 58. 1965; Anon., Ind. Sem. Stich. Konink. Rotterdam. Dierg. [6]. 1965; Anon., Delect. Sem. Grad. Bot. Univ. Bucarest. 1964: 35. 1965; Raymond, Ann. '65 Result. Jard. d'Essai Jard. Bot. Montréal 85. 1965; Florists' Rev. April 15. 1965; Neal, In Gard. Hawaii, new rev. ed., 722. 1965; Moldenke, Phytologia 13: 180. 1966.

Altman & Dittmer (1964) report that this plant is attacked by the chrysanthemum nematode (Aphelenchoides ritzema-bosi) in both North America and Europe. This nematode attacks about thirty other kinds of plants, including chrysanthemum, larkspur, phlox, strawberry, and zinnia. It is a vagrant endoparasite of the buds and foliage. Symptoms are crumpled distorted leaves and leaf-spots. Control is effected by the hotwater treatment of the dormant plants and by parathion sprays.

Brilmayer (1962) says: "hortensis — verbena hybrids -- The well-known garden verbenas, with trailing stems, soft hairy leaves, and clusters of vivid flowers sometimes with sparkling white eye. Seeds are usually listed as 'trailing verbenas' in contrast with dwarf or bushy types, or as hybrida gigantea in a selection of red, white, pink or salmon shades, or mixtures."

Raymond (1965) lists "Candy Stripe", "Dark Blue", "Sultan's Blue", and "Mid-Blue" as Dwarf Compacts and "Rose-pink as Semi-Double, all cultivated in Canada. The Florists' Rev. (1965) lists many varieties offered to the trade by Buckley & Son and by Schlosser & Sons [both of Springfield, Illinois], Wamego Floral Company [of Wamego, Kansas], and Zehm Greenhouses [of Huntington, Indiana].

In a letter to me from Jerome H. Kantor, Director of Research for the W. Atlee Burpee Company, Philadelphia, Pennsylvania, he says: "We are glad to know of your interest in verbenas and are asking Mr. Ellwood Pickering, who is doing our flower research at Floradale Farms, to send you some information on the origin of the new semi-double verbena, Miss Susie. The original semi-double plant was discovered as a mutant and has been hybridized to introduce this character into otherwise desirable types.....I might point out that two of the varieties we presently offer, Floradale Beauty and Lavender Glory, are the results of incomplete dominance. In the case of the Lavender it has not been possible to produce a

true breeding strain of this color by inbreeding. The Lavender is a heterozygous form, the dominat being purple and the recessive being white. Theoretically, it should be possible to produce a good lavender by making an F_1 hybrid, but so far we have been unable to do this on a commercial basis.

"The bright salmon of Floradale Beauty is similar. In each case we have felt that the color we were after was good enough and desirable enough so that our customers would not mind having some of the homozygotes show up in the planting. As a matter of fact, a lavender mixture can be made by planting these two, Lavender Glory and Floradale Beauty, as it includes practically all of the verbena colors with the exception of blue."

Mr. Pickering, in his letter to me of March 11, 1965, says: "There is little that I can add to what Mr. Kantor has told you.. about Miss Susie Verbena. It was as he said a mutant in a trial row of Floradale Beauty. I might add that Miss Susie has a pure salmon pink color while Floradale Beauty....is a variable shade of nearly the same color. The extra petals are very recessive when crossed with the regular type. Only one or two will appear in a population of several hundred F/2 plants. It is also interesting to note that the foliage of these plants also has extra projections and curls. This is underdesireable as some gardeners may think it is a disease. We hope to have several more colors in this type on the market soon."

Additional citations: CULTIVATED: Mexico: Madrigal s.n. [11. X.1964] (Ip).

xVERBENA ILLICITA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 467. 1965.

One each of the A. R. Moldenke 833 & 975 collections cited by me previously as in my personal herbarium are now in the herbarium of Aarhus University.

VERBENA INAMOENA Briq.

Additional bibliography: Moldenke, Phytologia 10: 111. 1964; Rambo, Pesquis. Bot. 21: 33. 1965; Moldenke, Phytologia 13: 184. 1966.

Rambo (1965) cites Herb. Anchieta 41219, collected by himself in Rio Grande do Sul, Brazil, as having been identified as this species, but comments that "V. inamoena.....is at best a variety of V. bonariensis L." and so he cites it under the latter species.

VERBENA INCISA Hook.

Additional bibliography: Moldenke, Phytologia 11: 467--468. 1965; Anon., Ind. Sem. Stich. Konink. Rotterdam. Dierg. [6]. 1965; Moldenke, Résumé Suppl. 12: 5. 1965; Rambo, Pesquis. Bot. 21: 58. 1965.

Additional citations: BRAZIL: Rio de Janeiro: Strang 580 [Herb. Cent. Pesq. Florest. 3336] (Ac).

xVERBENA INTERCEDENS Briq.

Additional bibliography: Moldenke, Phytologia 11: 468. 1965.
Additional citations: PARAGUAY: Hassler 6149 [Macbride photos 17422] (W--photo of cotype).

VERBENA INTERMEDIA Gill. & Hook.
Additional bibliography: Moldenke, Phytologia 11: 468. 1965; Rambo, Pesquis. Bot. 21: 35 & [59]. 1965.
Smith & Reitz found this plant ruderal and in dry woods, at 1200--1300 meters altitude.
Rambo (1965) cites Herb. Anchieta 4386 & 34723 from Rio Grande do Sul, Brazil, collected by himself, but comments "Probably nothing else but a poorly developed specimen of V. bonariensis L." He describes the plant as "Erect, stiff, up to 50 cm high", growing in "More or less wet, grassy Campos" in the "Northeastern Highlands" of that state, with a general distribution of "RGS, Uruguay, Argentina Mesopotamia".
Additional citations: BRAZIL: Santa Catarina: Smith & Reitz 14330 (Ac). ARGENTINA: Mendoza: Wilczek 56 [Macbride photos 24683] (W--photo).

VERBENA JORDANENSIS Moldenke
Additional bibliography: Moldenke, Phytologia 9: 385--386. 1963.
Smith & Reitz found this species ruderal in dry open flats by roads, at 700--900 meters altitude, flowering in October.
Additional citations: BRAZIL: Santa Catarina: Smith & Reitz 12479 (Ac). São Paulo: Leite 3474 (G--isotype).

VERBENA LACINIATA (L.) Briq.
Additional bibliography: Moldenke, Biol. Abstr. 35: 1688. 1960; Hocking, Excerpt. Bot. A.4: 592. 1962; Troncoso, Darwiniana 13: 469. 1964; Moldenke, Phytologia 11: 468--469 & 483 (1965) and 12: 225 & 230. 1965; Rambo, Pesquis. Bot. 21: 58. 1965.
Thanks to the recent fine revisionary work on some of the Argentine members of this species complex done by Troncoso (1965), it appears that the Herb. Herter 79174, 79227, & 96600, Herter 181c & 181i, and Herter & Strahl 181, originally distributed as V. erinoides Lam. and cited by me previously as V. tenera Spreng, are actually V. selloi Spreng., while the Herb. Inst. Miguel Lillo 32759, Schreiter 1904, Tweedie s.n., and Wilkes Exped. s.n., also originally so distributed but cited by me as V. dissecta Willd., are actually V. tenera Spreng.
Additional citations: ECUADOR: Chimborazo: Fagerlind & Wibom 799 (Mi).

VERBENA LASIOSTACHYS Link
Additional bibliography: Moldenke, Biol. Abstr. 45: 5377 & 7026. 1964; Moldenke, Phytologia 11: 469. 1965.

VERBENA LILACINA Greene
Additional bibliography: Moldenke, Phytologia 11: 469. 1965;

Moldenke, Résumé Suppl. 12: 12. 1965.

Additional citations: CEDROS ISLAND: Haines & Hale s.n. [9 March 1939] (Mi); R. Moran 10698 (Mi).

VERBENA LINDMANII Briq.

Additional bibliography: Moldenke, Phytologia 11: 469. 1965; Rambo, Pesquis. Bot. 21: 41—42 & [60]. 1965.

Rambo (1965) cites Herb. Anchieta 437, 4852, 6739, 8360 [Emrich s.n.], 10034, 11638 [Buck s.n.], 27121, 27291, 29211, 30978, 32011 [Reitz 874], 33140, 33809 [Emrich s.n.], 34722, 37731, 37777, 39352, 39444, 39621, 39697, 40398, 41059, 51413, 51557, 53037, 57071, 59160 [Pivetta 972], & 61584 [Camargo 2683] from Rio Grande do Sul, 49646 from Santa Catarina, and 50832 [Hatschbach 1181] from Paraná, Brazil — all collected by himself except where otherwise noted. He describes the plant as "Erect, wiry, more or less leafless, a few branches from a woody rootstock, up to 75 cm high", growing on "Very dry, open Campos..... Apparently over the whole of the Campos area" in Rio Grande do Sul, with a general distribution "From Paraná to RGS and Misiones".

VERBENA LIPOZYGIOIDES Walp.

Additional bibliography: Moldenke, Biol. Abstr. 45: 7026. 1964; Moldenke, Phytologia 9: 480 & 501—502. 1964.

Additional citations: CHILE: Province undetermined: Besser 136 [Macbride photos 17427] (W—photo of logotype).

VERBENA LITORALIS H.B.K.

Emended synonymy: Verbena lanceolata Willd. ex Spreng. in L., Syst. Veg., ed. 16, 2: 748. 1825 [not V. lanceolata Beck, 1828, nor Boldo, 1947]. Verbena nudiflora Nutt. ex Turcz., Bull. Soc. Nat. Mosc. 36 (2): 195—196. 1863 [not V. nudiflora L., 1808].

Additional & emended bibliography: N. J. Anderss., Galap. Veg. 200. 1854; N. J. Anderss., Vet. Akad. Handl. Stockh. 1853: 200. 1855; Turcz., Bull. Soc. Nat. Mosc. 36 (2): 195—196. 1863; H. B. Davis, Life & Works Pringle 132. 1936; Hocking, Excerpt. Bot. A.4: 592. 1962; Soukup, Biota 5: 194. 1964; Moldenke, Biol. Abstr. 45: 6658, 7026, & 8025. 1964; Neal, In Gard. Hawaii, new rev. ed., 721—722. 1965; Rambo, Pesquis. Bot. 21: 42—44 & [60]. 1965; Moldenke, Phytologia 11: 442, 469—470, & 501 (1965), 12: 205 (1965), and 13: 188. 1966.

Recent collectors have encountered this plant in much disturbed woods of Quercus, Liquidambar, and Clethra and abundant on exposed lava on Quaternary continental deposits. Raven & Breedlove found it growing on slopes with Quercus, Pinus, and Liquidambar, at 5400 feet altitude. They describe the flowers on their no. 19907 as "pale-blue"; Tucker 990 had "lavender" flowers, while his 1308 had "corolla-throat pale-lavender or white, lobes lavender"; Ricardi & Marticorena 3629/17 had "blue"

flowers. A common name for the plant in British Honduras is "verbena de montana", while Neal (1965) records "ha'uowi", "ha'uoi," "oi", and "owi" from Hawaii and Israel records "puringa" from Easter Island.

The Pedersen 6417, originally distributed as V. litoralis, is actually V. brasiliensis Vell. Andersson (1854) cites a C. Darwin s.n. from Chatham Island in the Galapagos. Rambo (1965) cites Herb. Anchieta 436, 2988, 3795, 4171, 6548, 6556, 6570, 8461, 8867, 9086, 9752, 11254 [Buck s.n.], 25164 [Theissen s.n.], 25791, 26005, 26691 [Friderichs s.n.], 28223, 29245, 29752 [Bruxel s.n.], 32190, 32646 [Henz s.n.], 35346 [Henz s.n.], 38055, 38193, 38254, 38581, 38723, 39911, 39997, 40188, 44762, 44813, 45117, 45339, 46069, 46416, 48067, 48657, 49506, 49723, 50174 [Emrich s.n.], 50554 [Sehnem 4470], 51449, 53120, 55075 [Camargo 90], 59429 [Camargo 959], 60406 [Camargo 621], 60703, 61623 [Camargo 2727], 62112 [Camargo 2014], 62500 [Camargo 2145], 63255 [Spies s.n.], 63272 [Sacco 827], 63275 [Sacco 855], 64057 [Sacco 259] from Rio Grande do Sul, 53631 from Paraná, and 31416, 60152, 61117 [Mattos s.n.], & 61142 [Mattos s.n.] from Santa Catarina, Brazil — all collected by himself except where otherwise indicated. He describes the plant as "Herbaceous, more or less lignified at the base, moderately branched, up to 1 m high.....Apparently not native, always on altered soil....Very common over the whole of the cultivated area" in Rio Grande do Sul, with a general distribution "From southern USA to Uruguay, central Argentina, Chile and Juan Fernandes."

Additional citations: MEXICO: Chiapas: Raven & Breedlove 19907 (Ac). México: Lagúnez 87 (Ip). Michoacán: Hinton & al. 13956 (Mi). San Luis Potosí: R. M. King 4432 (Mi); J. Rzedowski 8137 (Ip). Vera Cruz: J. Rzedowski 18943 (Ip); Scora & Scora 2452 (Ip). GUATEMALA: El Petén: Contreras 2635 (S). BRITISH HONDURAS: Gentle 7119 (S). EL SALVADOR: Chalatenango: Tucker 990 (Mi). Santa Ana: Tucker 1308 (Mi). BRAZIL: Rio de Janeiro: Castellanos 24514 [Herb. Cent. Pesq. Florest. 3206] (Ac), 24562 [Herb. Cent. Pesq. Florest. 3177] (Ac). CHILE: Atacama: Ricardi & Marticorena 3629/17 (Ac). Colchagua: Ricardi s.n. [Cerros de Nancagua, 11-I-1951] (Ac). Tarapacá: Ricardi 3352 (Ac). EASTER ISLAND: Israel s.n. [24.V.1956] (Ac).

VERBENA LITORALIS var. ALBIFLORA Moldenke

Additional bibliography: Moldenke, Phytologia 10: 75--76. 1964; Soukup, Biota 5: 194. 1964.

VERBENA LOBATA Vell.

Additional bibliography: Moldenke, Phytologia 11: 470. 1965; Rambo, Pesquis. Bot. 21: 44--46 & [60]. 1965.

Smith & Reitz found this plant growing on cliffs in Santa Ca-

tarina, Brazil.

Rambo (1965) cites Herb. Anchieta 2293, 2782, 2816, 4295, 4479, 4482, 4505, 8663, 8881, 8984, 29983, 30977, 32116, 32118, 32302, 32303, 32424, 32939 [Friderichs s.n.], 34726, 35193, 35725 [Henz s.n.], 36418, 38742, 40268, 44832, 44988, 45318, 45640, 45682, 47724 [Sehnem 3958], 48084, 48588 [Sehnem s.n.], 50185 [Emrich s.n.], 51130, 51405, 51462, 51912, 51949, 52084, 52817 [Emrich s.n.], 53791, 55076, 55965, 56762, 56821, 56927 [Emrich s.n.], 61817 [Camargo 2297], 62729 [Camargo 2332] from Rio Grande do Sul, 31861 [Reitz 1215], 49570, 49605, 50968 [Sehnem 5449], 60070, & 61145 [Mattos s.n.] from Santa Catarina, and 35960 [Hatschbach 403] & 64104 [Hatschbach 4306] from Paraná, Brazil -- all collected by himself except where otherwise designated. He describes the plant as "Ascending to erect and leaning to the neighbors, up to 1 m high", growing in "Wet to swampy Campos thickets" in the "Northeastern quadrant only, very common on the Highlands" in Rio Grande do Sul, with a general distribution "From Minas Gerais to RGS and Misiones."

Additional citations: BRAZIL: Paraná: Saito & Pereira 506/103 (Ac). Santa Catarina: Smith & Reitz 14178 (W—2451602). State undetermined: Sellow s.n. [Brasilia; Macbride photos 34348] (W—photo).

VERBENA LOBATA var. GLABRATA Moldenke

Additional bibliography: Moldenke, Phytologia 10: 82. 1964; Rambo, Pesquis. Bot. 21: 44. 1965.

Rambo (1965) cites Herb. Anchieta 2816, collected by himself in Rio Grande do Sul, Brazil, as V. lobata Vell., but admits that it has been identified as var. glabrata.

VERBENA LONGIFOLIA Mart. & Gal.

Additional bibliography: Turcz., Bull. Soc. Nat. Mosc. 36 (2): 196. 1863; Moldenke, Biol. Abstr. 36: 4036. 1961; Hocking, Excerpt. Bot. A.5: 44. 1962; Moldenke, Phytologia 11: 470. 1965.

Floyed & Ryan describe this plant as a "shrub to 4 ft. tall", with white corollas, growing in semi-shade on rocky clay loam, and flowering in June. Rzedowski encountered it at 100 meters altitude, flowering and fruiting in February.

Additional citations: MEXICO: Guerrero: Floyed & Ryan 84 (Mi). San Luis Potosí: J. Rzedowski 9754 (Ip).

VERBENA LONGIFOLIA f. ALBIFLORA Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 36: 4036. 1961; Hocking, Excerpt. Bot. A.5: 44. 1962; Moldenke, Phytologia 10: 85. 1964.

VERBENA LUCANENSIS Moldenke

Additional bibliography: Soukup, Biota 5: 194. 1964; Moldenke, Phytologia 10: 85—86. 1964.

VERBENA MACDOUGALII Heller

Additional bibliography: Moldenke, Biol. Abstr. 45: 6658 & 8025. 1964; Moldenke, Phytologia 11: 462 & 470--471. 1965; Moldenke, Résumé Suppl. 12: 2. 1965.

Additional citations: ARIZONA: Apache Co.: Deaver 6412 (Ac), 6447 (Ac).

VERBENA MALMII Moldenke

Additional bibliography: Moldenke, Phytologia 10: 121--122. 1964; Rambo, Pesquis. Bot. 21: 58. 1965.

VERBENA MARITIMA Small

Additional bibliography: Moldenke, Phytologia 11: 471. 1965.

Demaree found this plant growing on sandy canal banks.

Additional citations: FLORIDA: Brevard Co.: Demaree 50170a (Ac). Indian River Co.: Demaree 49422 (Ac).

VERBENA MARRUBIOIDES Cham.

Additional bibliography: Moldenke, Phytologia 11: 471. 1965; Rambo, Pesquis. Bot. 21: 46 & [60]. 1965.

The Reiss 16a, originally distributed as V. marrubioides, is actually V. hirta Spreng.

Rambo (1965) cites Herb. Anchieta 451, 27065, 27293, 29028, 29105, 30629, 37698, 43689, 43843, 44156, 48879, 57298, & 62095 [Camargo 1836] from Rio Grande do Sul, and 31723, 31902 [Reitz 1281], & 21906 [Reitz 1297] from Santa Catarina, Brazil -- all collected by himself except where otherwise indicated. He describes the plant as "Prostrate, branches radiating from a woody rootstock, up to 40 cm long", growing in "Very dry, grassy Campos" in Rio Grande do Sul. He notes that "All collections from the northeastern Lowlands and sea coast" in that state, and gives the general distribution of the species "From Paraná to Uruguay; Peru to northern Argentina."

Additional citations: BRAZIL: Paraná: Dombrowski 683 (Z); Dombrowski, Saito, & Pereira 815/605/199 (Ac). State undetermined: Sellow s.n. [Bras. merid.; Macbride photos 17429] (W--photo of type).

VERBENA MEGAPOTAMICA Spreng.

Additional bibliography: Rambo, Pesquis. Bot. 21: 46--47. 1965; Moldenke, Phytologia 11: 471. 1965.

Rambo (1965) places V. phlogiflora Cham. in the synonymy of this species on page 46 of his work, but keeps it as distinct on pages 49--50. He cites for V. megapotamica Herb. Anchieta 4336, 4561, 8513, 8781, 8999, 9388, 9767, 11535 [Buck s.n.], 30980, 34729, 52102, 53458, 54947, 56659, 59127 [Pivetta 977], & 59244 from Rio Grande do Sul, and 60153 from Santa Catarina, Brazil -- all collected by himself except where otherwise indicated. He describes the plant as "Herbaceous, vigorous, erect or recumbent,

with large, and showy flowers in dense inflorescences", growing in "Wet to swampy thickets in the Campos area" of Rio Grande do Sul, specifically "Northern Campos, especially in the Northeast", with a general distribution "From Minas Gerais to Uruguay and Buenos Aires."

Additional citations: BRAZIL: Rio Grande do Sul: Sellow 13 [Macbride photos 17438, in part] (W--photo of type). State undetermined: Sellow s.n. [Brasil meridionali; Macbride photos 17438, in part] (W--photo).

VERBENA MENDOCINA R. A. Phil.

Additional bibliography: Moldenke, Phytologia 11: 471. 1965.

Additional citations: ARGENTINA: Mendoza: R. A. Philippi s.n. [1868; Macbride photos 17430] (W--photo of isotype).

VERBENA MENTHAEFOLIA Benth.

Additional bibliography: Turcz., Bull. Soc. Nat. Mosc. 36 (2): 197. 1863; Moldenke, Phytologia 11: 471--472 & 502. 1965.

Powell & Edmondson describe the plant as "infrequent" in Sinaloa, Mexico. Recent collectors have found it growing in secondary or xerophilous matorral, ruderal, and in cultivated soil.

Additional citations: MEXICO: Federal District: S. Espinosa s. n. [Ciudad Universitaria, X.1954] (Ip). Hidalgo: I. M. C. Fonseca s.n. [4.VIII.1963] (Ip); L. G. Quintero s.n. [7.IX.63] (Ip). México: Galicia s.n. [22.VIII.1952] (Ip); Lachica s.n. [23.VI.1963] (Ip); Madrigal S.725 (Ip); Paray 2956 (Ip); Villamar C. s.n. [6. IX.1964] (Ip). Sinaloa: Powell & Edmondson 914 (Mi). Vera Cruz: Dodds 91 (Mi).

VERBENA MICROPHYLLA H.B.K.

Additional bibliography: Soukup, Biota 5: 194. 1964; Moldenke, Phytologia 11: 472, 484, & 485 (1965) and 12: 118 & 288. 1965.

Thanks to the recent fine revisionary work done by Troncoso (1965) on certain Argentine member of this species complex, it appears that the Herb. Inst. Miguel Lillo 32795 and Schreiter 6643, originally distributed as V. microphylla and cited by me previously as V. tenera, are actually V. selloi Spreng., while the Carette s.n. [Monte Hermoso, 1916], cited by me as V. microphylla, is actually V. tenera Spreng. The O'Donell 4600, cited below, was previously erroneously cited by me as V. dissecta Willd., while A. T. Hunziker 6471 and T. Meyer 2409 were previously cited by me as V. tenera Spreng.

The flowers on T. Meyer 2409 are described as "purple", while those on A. T. Hunziker 6471 were "violet". Hunziker found the species "frequent along roadsides" in Córdoba.

Additional citations: ARGENTINA: Buenos Aires: T. Meyer 2409 (N). Córdoba: A. T. Hunziker 6471 (N). Tucumán: O'Donell 4600 (N).

VERBENA MINUTIFLORA Briq.

Additional bibliography: Moldenke, Biol. Abstr. 35: 1688. 1960; Hocking, Excerpt. Bot. A.4: 592. 1962; Angely, Fl. Paran. 32: 69. 1964; Moldenke, Phytologia 11: 472. 1965; Moldenke, Résumé Suppl. 12: 5. 1965.

Leite 3744 is said to have had "violet" flowers, blooming in November. Smith & Klein found the species growing in bogs and ruderal by small rivers.

Additional citations: BRAZIL: Paraná: Saito & Pereira 436/33 (Ac). Santa Catarina: Smith & Klein 13469 (Ac). São Paulo: Leite 3744 (Ac).

xVERBENA MOECHINA Moldenke

Additional synonymy: Verbena lanceolata Beck, Am. Journ. Sci. & Arts 14: 118. 1828 [not V. lanceolata Boldo, 1947, nor Willd., 1825].

Additional bibliography: Beck, Am. Journ. Sci. & Arts 14: 118. 1828; Moldenke, Phytologia 11: 472. 1965; Moldenke, Résumé Suppl. 12: 12. 1965.

The V. lanceolata of Boldo is V. hastata L., while that of Willdenow is V. litoralis H.B.K.

I have not seen the actual type of Beck's Verbena lanceolata, but from his description and the locality of collection it would appear to be identical with this hybrid. His description is as follows: "V. erecta, hirsuta; foliis lanceolatis, acutiusculis, basi attenuatis, subsessilibus, inciso-serratis; spica terminale, stricta, imbricata; bracteis lanceolatis, calyce superantibus. Stems simple, two or three feet high, stifly erect, hairy. Leaves three to four inches long, about an inch in breadth, crowded together, somewhat acute, coriaceous, much attenuated at base, subsessile. Spike simple, terminal, dense flowered, imbricate. Flowers small, blue. Bracts narrow-lanceolate, acute, longer than the calyx. Resembles V. Stricta in habit." The name, although definitely proposed as a new one and accompanied by a good description, has been ignored by the authors of the Index Kewensis.

VERBENA MONTEVIDENSIS Spreng.

Additional bibliography: Hocking, Excerpt. Bot. A.4: 592. 1962; Reitz & Klein, Sellowia 16: 73 & 117. 1964; Moldenke, Biol. Abstr. 45: 6658 (1964) and 46: 3246. 1965; Moldenke, Phytologia 11: 473. 1965; Rambo, Pesquis. Bot. 21: 40—41 & [60]. 1965.

Recent collectors have found this plant growing in woods, dry woods, bogs, and ruderal in Santa Catarina, Brazil. Rambo (1965) cites Herb. Anchieta 446, 1129, 8574, 8788, 9374, 10204 [Friderichs s.n.], 11258 [Friderichs s.n.], 11260 [Friderichs s.n.], 30979, 32261, 34721, 36411, 44689, 45545, 49374, 50026, 51616, 52083, 54985, 56559, 56655, 59873 [Camargo 1192], 62791 [Camargo 2480], 62960 [Camargo 3125], & 63416 [Sacco 1086] from Rio Grande do Sul, and 54308 [Reitz 4971], 54372 [Reitz 5092], 58407 [Reitz

8374], 60193, 61104 [Mattos s.n.], 64261 [Mattos s.n.], & 64283 [Mattos s.n.] from Santa Catarina, Brazil — all collected by himself except where otherwise indicated. He describes the plant as "Erect, lignified at the base, besom-like ramified in the upper third, up to 2 m high", growing in "Densely vegetated swamps" in the "Northern Highlands especially in the Northeast, sea coast" in Rio Grande do Sul, with a general distribution of "From Minas Gerais to RGS and northeastern Argentina."

Additional citations: BRAZIL: Paraná: Dombroski 1034 [Saito 851; Herb. Inst. Def. Pat. Nac. 9443] (Ac); Dombroski & Saito 973/795 (Ac); Lourdes Pereira 96 [Herb. Inst. Def. Pat. Nac. 9445] (Ac); Reiss 56 (Mi); Saito 69 [Herb. Inst. Def. Pat. Nac. 9442] (Ac). Santa Catarina: Castellanos 24766 [Herb. Cent. Pesq. Florest. 3377] (Ac); Smith & Klein 14102 (W—2451611); Smith & Reitz 14332 (W—2451613). URUGUAY: H. H. Bartlett 21301 (G); Sellow s.n. [Montevideo; Macbride photos 17432] (W—photo of type).

VERBENA MULTIGLANDULOSA Moldenke

Bibliography: Moldenke, Phytologia 12: 479—480. 1966.

Citations: CHILE: Coquimbo: Marticorena & Matthei 315 (Z—type).

VERBENA NANA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 473. 1965.

VERBENA NEOMEXICANA (A. Gray) Small

Additional bibliography: Moldenke, Phytologia 11: 473, 490, 501, & 502. 1965.

Weber & Charette found this plant growing on Acacia flats and low rocky knolls in Chihuahua, Mexico. The Straw & Forman 1380 distributed as this species is actually V. perennis var. johnstoni Moldenke.

Additional citations: TEXAS: Brewster Co.: E. G. Marsh Jr. s.n. [Jul. 1935] (Au—226482). Travis Co.: R. B. Payton 26 (Ld). MEXICO: Chihuahua: Weber & Charette 11660 (Mi).

VERBENA NEOMEXICANA var. HIRTELLA Perry

Additional bibliography: Moldenke, Phytologia 11: 473 & 502. 1965.

The Salgado s.n. [17.V.1961], originally distributed as this variety, is actually V. canescens var. roemeriana (Scheele) Perry.

Additional citations: MEXICO: Puebla: F. M. Leal s.n. [Teplaca, 24.VII.1955] (Ip).

VERBENA NEOMEXICANA var. XYLOPODA Perry

Additional bibliography: Moldenke, Phytologia 11: 473 & 502. 1965.

VERBENA NIVEA Moldenke

Additional synonymy: Verbena nicea Moldenke ex Hocking, Excerpt. Bot. A.5: 45, sphalm. 1962.

Additional bibliography: Moldenke, Biol. Abstr. 37: 1062. 1962; Hocking, Excerpt. Bot. A.5: 45. 1962; Moldenke, Phytologia 11: 474. 1965; Moldenke, Résumé Suppl. 12: 12. 1965.

VERBENA NIVEA f. ROSEA Moldenke

Additional synonymy: Verbena nicea f. rosea Moldenke ex Hocking, Excerpt. Bot. A.5: 45, sphalm. 1962.

Additional bibliography: Moldenke, Biol. Abstr. 37: 1062. 1962; Hocking, Excerpt. Bot. A.5: 45. 1962; Moldenke, Phytologia 11: 474. 1965; Moldenke, Résumé Suppl. 12: 12. 1965.

VERBENA OFFICINALIS L.

Additional bibliography: N. J. Anderss., Galap. Veg. 199. 1854; N. J. Anderss., Vet. Akad. Handl. Stockh. 1853: 199. 1855; Loes., Verh. Bot. Ver. Brand. 53: 74 [Abhandl. 239]. 1912; H. B. Davis, Life & Works Pringle 193. 1936; Clair, Of Herbs & Spices 153 & 232. 1961; Tergit, Fls. Through the Ages 233—234. 1961; Bohm, Pflanzenschutz 31 (4/5): 67—68. 1964; R. Pearson, An. & Pl. Cenozoic Era 58 & 72. 1964; Perring & Walters, Fl. Cambridg. 179. 1964; Loewenfeld, Herb. Gardening 214—216. 1964; Bohm, Biol. Abstr. 45: 7066 (1964), 45 (20): B.131 (1964), and 46: 3246. 1965; Moldenke, Résumé Suppl. 12: 8 & 12. 1965; Moldenke, Phytologia 11: 474—476, 501, & 502 (1965) and 13: 188. 1966.

Bohm (1964) states that this is an important transitional host for Aphis frangulae (A. gossypii), which attacks Cucurbitaceae and Rhamnaceae in eastern Austria in time of depression in midsummer and late summer, and is an essential limb in the secondary host plant range which concludes with the Cucurbitaceae in autumn.

Bergit (1961) says that "A flower which possessed all desirable magical qualities in abundance was the vervain or holy wort. The Druid priests used to make a sacrifice to earth before they cut a twig of vervain or mistletoe. In German the plant, and indeed the whole Verbenaceae, is called iron-herb, and Hieronymus Bock, reproving the women of the time for their foolish superstitions goes on to say 'Thus the vervain is called iron-herb with us, because we use it to harden iron'. Poachers in Bohemia rubbed their guns with vervain which they had picked, naked, before dawn on midsummer day, and a gun so treated was believed never to miss."

Perring & Walters (1964) report the species as "occasional throughout the county [Cambridgeshire, England] on roadsides and in grassy and waste places" and record it from England, Wales, Eire, and Fife [in Scotland]. They note that it was listed by Ray as far back as 1660. Pearson (1964) states that its seeds have been found at the climatic optimum in the Ipswichian interglacial period in association with Hedera and Buxus pollen.

Clair (1961) quotes the following medieval couplets:

"Whoever weareth Vervín or Dill
May be bold to sleep on every hill"

"Trefoil, Vervain, John's Wort, Dill
Hinder witches of their will"

"Here holy vervayne and here dill
'Gainst witchcraft much availing"

The same author adds the vernacular name "vervín". The M. Abarca 13, originally distributed as V. officinalis, is actually V. carolina L.

Additional citations: ISRAEL: Beach 5407 (W—2336674). AFGHANISTAN: Beach 5110 (W—2336478). KOREA: Yongsok 8347 (Mi). HAINAN ISLAND: Lei 231 (Mi).

VERBENA ORIGENES R. A. Phil.

Additional bibliography: Moldenke, Phytologia 11: 475. 1965.

This species has been found growing at 2900 meters altitude in Atacama.

Additional citations: CHILE: Atacama: C. Castro s.n. [La Puerta, 20.XII.1963] (Ac); R. A. Philippi s.n. [Pajonal; II.1854; Macbride photos 17434] (W—photo); Ricardi, Marticorena, & Matthei 630 (Ac). Coquimbo: Ricardi, Marticorena, & Matthei 690 (Z).

VERBENA OVATA Cham.

Additional bibliography: Moldenke, Phytologia 10: 289—292. 1964; Rambo, Pesquis. Bot. 21: 47 & [60]. 1965.

Rambo (1965) cites Herb. Anchieta 9674 & 61356 [Pivetta 1125] from Rio Grande do Sul, the former collected by himself. He describes the plant as "Erect, very coarse, leaves very large and broad", growing in "Swampy thickets" in the "Northwestern Highlands only" of that state, with a general distribution of "Misiones, western RGS, Uruguay".

Additional citations: BRAZIL: State undetermined: Sellow 3671 [Macbride photos 17435] (W—photo of type).

VERBENA PARANENSIS Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 33: 1215. 1959; Hocking, Excerpt. Bot. A.5: 44. 1962; Moldenke, Phytologia 10: 292—293. 1964.

VERBENA PARODII (Covas & Schnack) Moldenke

Additional bibliography: Moldenke, Phytologia 11: 476. 1965.

Recent collectors have encountered this species in fruit in February and March and record the vernacular name "te de burro". Material has been misidentified and distributed in herbaria under the names V. glandularia Jörgensen and V. sulphurea D. Don. The Jörgensen 1613 & s.n. [26.III.917], Herb. Inst. Miguel Lillo 31745, and Herb. Osten 10676, cited below, were previously incorrectly cited by me as V. dissecta Willd., while Jörgensen 1737, Herb. Inst. Miguel Lillo 31472, and Rufz Leal 7092 were previous-

ly incorrectly cited as V. tenera Spreng.

Additional citations: ARGENTINA: Catamarca: Jörgensen 1613 [Herb. Inst. Miguel Lillo 31745] (N), 1737 [Herb. Inst. Miguel Lillo 31472] (N), s.n. [26.III.917; Herb. Osten 19676] (N). Mendoza: Ruíz Leal 7092 (N).

VERBENA PARVULA Hayek

Additional bibliography: Moldenke, Biol. Abstr. 35: 1688. 1960; Hocking, Excerpt. Bot. A.4: 592. 1962; Moldenke, Phytologia 10: 296—297 (1964) and 11: 485. 1965.

VERBENA PARVULA var. GIGAS Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 35: 1688. 1960; Hocking, Excerpt. Bot. A.4: 592. 1962; Moldenke, Phytologia 10: 297. 1964.

VERBENA PERAKII (Covas & Schnack) Moldenke

Additional synonymy: Glandularia pecakii Covas & Schnack ex Hocking, Excerpt. Bot. A.6: 335, sphalm. 1963.

Additional bibliography: Hocking, Excerpt. Bot. A.6: 335. 1963; Moldenke, Phytologia 11: 476. 1965; Moldenke, Résumé Suppl. 12: 10. 1965.

Venturi found this species growing in sandy soil at 750 meters altitude, with blue flowers (Venturi 10301), in anthesis in March. This collection was previously erroneously cited by me as V. dissecta Willd.

Additional citations: ARGENTINA: La Rioja: G. Dawson 3380 (Ip). Salta: Venturi 10301 (N).

VERBENA PERENNIS Wooton

Additional bibliography: Moldenke, Phytologia 11: 475, 476, & 502. 1965.

Additional citations: TEXAS: Brewster Co.: B. H. Warnock 20437 (Ld).

VERBENA PERENNIS var. JOHNSTONI Moldenke

Additional bibliography: Moldenke, Phytologia 10: 305—306. 1964.

Straw & Forman describe this plant as an erect perennial herb, common but scattered throughout woods in open pine-Yucca-scrub oak community on all slopes, with light-violet flowers fading to white in the throat, flowering and fruiting in July.

Additional citations: MEXICO: Nuevo León: Straw & Forman 1380 (Mi).

xVERBENA PERRIANA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 443, 462, 467, 475, & 476. 1965; Moldenke, Résumé Suppl. 12: 1. 1965.

Nieuwland describes the specimen cited below as "plant prostrate in circles a yard round, only the flowers ascending".

Additional citations: ALABAMA: County undetermined: Winchell 207 (W—73533). INDIANA: Saint Joseph Co.: Nieuwland s.n. [St. Mary's, Sept. 15, '24] (Mi).

xVERBENA PERTURBATA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 476. 1965; Moldenke, Biol. Abstr. 46: 3246. 1965.

VERBENA PERUVIANA (L.) Britton

Additional bibliography: Moldenke, Biol. Abstr. 35: 1688 (1960) and 36: 719. 1961; Brilmayer, All About Vines 350. 1962; Hocking, Excerpt. Bot. A.4: 592 (1962) and A.5: 44. 1962; Moldenke, Biol. Abstr. 46: 632, 3246, & 3618. 1965; Rambo, Pesquis. Bot. 21: 47—49 & [60]. 1965; Moldenke, Phytologia 11: 442, 470, & 476—477 (1965) and 13: 180. 1966.

Brilmayer (1962) calls this plant "Peruvian flame" and describes it as "Evergreen trailer offered by house and greenhouse growers for hanging baskets and summer containers. Its 2 inch crinkly leaves are roughly toothed, the flowers a glowing crimson. A variation 'Chiquita' has flowers striped with gay red and white, like peppermint candy."

Rambo (1965) cites Herb. Anchieta 450, 1137, 3042, 7850, 8990, 9118, 9544, 9958, 11252 [Heidler s.n.], 25190 [Theissen s.n.], 25213 [Theissen s.n.], 25970 [Henz s.n.], 26767 [Friderichs s.n.], 27579, 29550, 32016, 32539 [Henz s.n.], 33438 [Henz s.n.], 36417, 37030 [Spies s.n.], 37347, 37498, 38753, 39592, 39810, 42606, 42781, 42941, 43282, 43524, 44275, 46335, 47821 [Sehnem 3882], 48727, 51274 [Emrich s.n.], 51348, 54786, 55909, 56245, 57493 [Camargo 33], 59156 [Pivetta 968], & 60456 [Camargo 502] from Rio Grande do Sul, and 55318 [Reitz 4703] from Santa Catarina, Brazil — all collected by himself except where otherwise indicated. He describes the plant as "Prostrate, branches radiating from a rootstok, up to 40 cm long", growing in "Dry, preferably sandy grassy Campos.....Over the whole of the Campos area, especially in the northeastern Lowlands and near the sea coast" in Rio Grande do Sul, with a general distribution of "From Peru, Bolivia and Paraguay to northern Argentina, RGS and Uruguay".

Additional citations: BRAZIL: State undetermined: Sellow s.n. [Macbride photos 17407] (W--photo). URUGUAY: Commerson 72 [Herb. Jussieu 5141, in part; Macbride photos 39503, in part] (W—photo). ARGENTINA: Buenos Aires: Commerson 71 [Herb. Jussieu 5141, in part; Macbride photos 39503, in part] (W--photo).

VERBENA PERUVIANA f. ALBA Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 36: 719. 1961; Hocking, Excerpt. Bot. A.5: 44. 1962; Moldenke, Phytologia 10: 416. 1964.

VERBENA PERUVIANA var. GLABRIUSCULA Kuntze

Additional bibliography: Moldenke, Phytologia 10: 490—491.

1964; Moldenke, Biol. Abstr. 46: 3618. 1965.

VERBENA PHLOGIFLORA Cham.

Additional bibliography: Rambo, Pesquis. Bot. 21: 46, 49--50, & [60]. 1965; Moldenke, Phytologia 11: 467 & 477. 1965.

Recent collectors have found this plant growing in forests, stream beds, on rocky banks, and ruderal in Santa Catarina. Rambo (1965) cites Herb. Anchieta 444, 1120, 2964 [Baglione s.n.], 4273, 4488, 4508, 4775, 7848 [Thiessen s.n.], 11605 [Buck s.n.], 25298 [Theissen s.n.], 26992, 28583, 30011 [Emrich s.n.], 32817, 33279 [Emrich s.n.], 35460 [Ritter s.n.], 35908, 36419, 37693, 38555, 39020, 43350, 43620, 43780, 44020, 44165, 49084, 50183 [Emrich s.n.], 52158, 53369, 54059, & 55939 from Rio Grande do Sul, 54366 [Reitz 5073], 54370 [Reitz 5090], & 55301 [Reitz 4741] from Santa Catarina, and 3982 from Uruguay -- all collected by himself except where otherwise noted. He admits, however, that 54366 [Reitz 5073] has been identified as f. alba Moldenke. He describes V. phlogiflora as "Herbaceous, weak, erect or leaning to the neighbors, up to 1 m high", found in "Wet to swampy thickets in the Campos area.....Over the whole area of the Campos" in Rio Grande do Sul, Brazil, with a general distribution "From Cuba to Uruguay and northern Argentina".

Additional citations: BRAZIL: Paraná: Dombrowski 528 (Ac). Santa Catarina: A. Castellanos 24780 [Herb. Cent. Pesq. Florest. 3564] (Ac); Smith & Klein 13223 (Ac); Smith & Reitz 12592 (Ac). PARAGUAY: Hassler 4585 (Mi).

VERBENA PHLOGIFLORA f. ALBA Moldenke

Additional bibliography: Rambo, Pesquis. Bot. 21: 50. 1965; Moldenke, Phytologia 11: 477. 1965.

VERBENA PINETORUM Moldenke

Additional bibliography: Moldenke, Phytologia 11: 477 & 502 (1965) and 13: 187. 1966; Moldenke, Résumé Suppl. 13: 2. 1966.

Recent collectors have found this species growing in rocky soil and matorral, fruiting in August. The O. M. Clark 7059, Paxson & Barkley 16M839, and C. L. Smith 221, in part, cited below, were erroneously cited by me as V. canescens H.B.K. in previous installments of these notes.

Additional citations: MEXICO: Hidalgo: O. M. Clark 7059 (N); Galván s.n. [4.VIII.1963] (Ip). México: Paxson & Barkley 16M839 (N). Oaxaca: C. L. Smith 221, in part (N).

VERBENA PLATENSIS Spreng.

Additional bibliography: Rambo, Pesquis. Bot. 21: 50—51 & [60], 1965; Moldenke, Phytologia 11: 477. 1965; Moldenke, Biol. Abstr. 46: 3618. 1965.

Rambo (1965) cites Herb. Anchieta 27997 [Rosengurtt B.810] & 32950 [Rosengurtt PE.5056] from Uruguay and 63156 [Spies s.n.] from

Rio Grande do Sul, Brazil. He describes the plant as "Prostrate, rooting at the lower joints, branches radiating, up to 30 cm long", growing in "Dry, grassy Campos" in the "Southwestern plains only" in Rio Grande do Sul, with a general distribution of "Chile, northern Argentina, Uruguay, westernmost RGS, Paraguay".

Additional citations: BRAZIL: State undetermined: Sellow s.n. [Macbride photos 24356] (W--photo). URUGUAY: Sellow s.n. [Montevideo; Macbride photos 17452] (W--photo of type).

VERBENA PLICATA Greene

Additional bibliography: Moldenke, Phytologia 11: 11--19, fig. 13 (1964) and 11: 451, 477, & 502. 1965; Moldenke, Résumé Suppl. 12: 2. 1965.

The corollas on Shinners 30033 are described as having been "violet-blue". Recent collectors have found the species growing in loose sand, red or loose red sand, light-tan sand, brick-red soil, gravel or Pleistocene gravel, light-tan sandy loam or light grayish-tan sandy loam, and grayish calcareous silt, and along sandy roadsides. The Flores call it "abundant in caliche" in Webb County, Texas. The Dominguez M. & McCart 8183, originally distributed as V. plicata, is actually V. halei Small.

Additional citations: OKLAHOMA: Cimarron Co.: C. M. Rogers 5437 (Mi), 5990 (Mi). TEXAS: Andrews Co.: Ballinger s.n. [May 1, 1960] (Au--221199). Duval Co.: P. Cabrera 55 (Au--233432); N. Castillo 6 (Au--233424); Flores, Chavez, & Hein 42 (Au--233433). Frio Co.: Lucas, Painter, & Barkley 14227 (Ld); J. R. Rodriguez 42 (Au--235229); B. L. Turner 4989 (Au--229412). Jim Hogg Co.: D. Montes 64 (Au--232735). LaSalle Co.: Winch 6 (Au--222240). Starr Co.: R. Acosta 73 (Au--232669); Alvarez, Guajardo, Salazar, & McCart 7923 (Au--222243), 8041 (Au--222194); Ramos, Sandoval, Salazar, & McCart 7867 (Au--222244). Stonewall Co.: Shinners 30033 (Au--222089). Webb Co.: Arzola 143 (Au--232754); Flores & Flores 117 (Au--233374); Gamboa & Dohnke 104 (Au--232755); Jorge Ramirez 39 (Au--232468); Soto, Herrera, & McCart 8070 (Au--222206). Zapata Co.: Herrera & McCart 7698 (Au--222238, Ip); Ramos, Sandoval, Salazar, & McCart 7847 (Au--222242); M. de J. Solis 106 (Au--233348). MEXICO: Guerrero: B. de la Garza 67 (Au--233423).

VERBENA POGOSTOMA Klotzsch

Additional bibliography: Moldenke, Phytologia 11: 19--20 (1964) and 11: 484. 1965.

Villafañe 524 is described as having had "purple" flowers, blooming in January. It was previously erroneously cited by me as V. dissecta Willd. The Hunziker collection cited below was previously cited by me, in error, as V. tenera Spreng. The flowers on Hunziker 5160 are described as "violet", blooming in March at 2500 meters altitude.

Additional citations: ARGENTINA: Córdoba: Villafañe 524 (N). La

Rioja: A. T. Hunziker 5160 (N). CULTIVATED: Germany: Herb. Hort. Bot. Berol. s.n. [Oct. 1839; Macbride photos 17440, in part] (W—photo of cotype), s.n. [Aug. 1843; Macbride 17440, in part] [W—photo of cotype).

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NOTES ON NEW AND NOTEWORTHY PLANTS. XLIII

Harold N. Moldenke

COMANTHERA KEGELIANA (Körn.) Moldenke, comb. nov.

Paepalanthus kegelianus Körn. in Mart., Fl. Bras. 3 (1): 438. 1863.

LEIOTHRIX VIVIPARA var. LONGIPILOSA Moldenke, var. nov.

Haec varietas a forma typica speciei pedunculis densissime longeque villosis, pilis patentissimis, recedit.

This variety differs from the typical form of the species in having the peduncles very densely white-villous, with long rather stiff hairs spreading at right angles.

The type of the variety was collected by Rolla Milton Tryon, Jr. and Alice F. Tryon (no. 6784) in dryish soil under rocks on grassland and sedgeland (with shrubby areas) with sandstone and quartzite rocks and derived soil, at 1295 meters altitude, on the Planalto of Serra do Cipó (a portion of Serra do Espinhaço) 85 km. north-northeast of Bello Horizonte, in the vicinity of the road from Lagoa Santa to Conceição do Mato Dentro at km. 133 from Bello Horizonte, Minas Gerais, Brazil, on November 21, 1965, and is deposited in my personal herbarium at Plainfield, New Jersey.

LIPPIA RECOLLETAE var. PICKELII (Moldenke) Moldenke, comb. nov.

Lippia pickelii Moldenke, Lilloa 5: 424—425. 1940.

LIPPIA TAYACAJANA var. SESSILIFLORA Moldenke, var. nov.

Haec varietas a forma typica speciei inflorescentibus sessilibus recedit.

This variety differs from the typical form of the species in having its inflorescences sessile or subsessile.

The type of the variety was collected by Paul C. Hutchison and J. Kenneth Wright (no. 7025) in the canyon of the Río Marañon 22 km. above Balsas on the road to Celendin, 4 km. east of Hacienda Limon, at an altitude of 1725 meters, province of Celendin, Cajamarca, Peru, on October 17, 1964, and is deposited in my personal herbarium at Plainfield, New Jersey. The collectors describe this plant as nearly or completely leafless shrubs to 2 m. tall, very local for several km., the flowers pale-cream with yellow centers, pleasantly fragrant, a tea being made from the leaves by the natives of the area.

BOOK REVIEWS

Alma L. Moldenke

"The Great American Forest", by Rutherford Platt, xii + 271 pp., illustr. Prentice-Hall Series in Nature and Natural History, Prentice-Hall Publishers, Inc., Englewood Cliffs, New Jersey 07632. 1965. $6.95.

"If only people would catch a vision of our fabulous forests, their ancient heritage, their beauty and beneficence, their meaning for our lives today. . . before it is too late". So ends this wonderful book. The vivid, awe-inspiring word pictures by this gifted and dedicated naturalist-author take the reader in arm chair comfort through the great forests of our continent -- the geologically ancient ones, the succeeding deciduous ones, the big tree sequoias and the redwoods, the various other conifer groups, the great north woods, and the mountain and coastal forests. The reader-tourist cannot help but be awed at the grandeur, appreciative of all the rich historical and literary references, charmed with anecdotes, and enriched by all the detailed biological information that describes the macroscopic and microscopic being of forests and their creatures so intimately dependent upon one another. He ought also to have renewed or developed dedication in one way or another to help save these natural (and national) resources.

The book has several of the author's artistically exquisite photographs. There is a useful index. Scientific explanations are given in an easily understandable manner. For readers (and the book deserves wide circulation) not familiar with our common names for trees, the scientific names would have been a helpful addition in the text or in a separate listing. The type is easily read. The following few typographical errors should have been caught before the book rolled off the presses for: Homo on p. xi, Smilodon on p. 5, wisteria on p. 20, our on p. 249, and such as uranium on p. 205. The definition of a calorie on p. 114 should have been more accurate, likewise "birds and animals" on p. 253. These picayune items do not change the value of the book. The teaching of our college, secondary and grade school instructors could be much enriched by their reading of this book.

"The wildness of our continent is a quality of life for all Americans whether or not they personally see it. The mere idea of hushed places among big trunks, of the nose of a moose cutting a V across a glassy lake, of pure dilvery water running in a brook, of salmon leaping up a waterfall, of bloodroot and partridge berry on a leaf carpet and skunk cabbage uncoiling its mottled shells among pussy willows; beaver, fox, and deer with big round eyes -- the knowledge that such things exist, that there is a North Woods, an unspoiled area in the deciduous forest,

a deep silent valley in the Rocky Mountains, enhances the value of every county park, hedgerow and woodlot."

"Advances in Ecological Research 2", edited by J. B. Cragg, xi + 264 pp., illustr. Academic Press, London & New York City, New York. 1964. 57s. 6d. or $9.50.

Continuing the intention expressed in the first volume "to present comprehensive accounts of selected topics of ecological research in such a way that biologists with a general interest in ecology, as well as specialists in ecology, can obtain a balanced picture of what is taking place", this new volume presents four valuable papers in quite thorough form.

The first is on population dynamics, is written by M. E. Solomon of the Pest Infestation Laboratory of Slough in England, is entitled "Analysis of Processes Involved in the Natural Control of Insects", and is concerned with expounding the types of processes influencing abundance, the roles of different factors and processes in natural control, the density relationships in the action of predators and parasites, and an inquiry into parasite-host oscillations.

The second is entitled "The Use of Statistics in Phytosociology", is authored by J. M. Lambert and B. M. Dale of the Botany Department of the University of Southampton in England, is developed along some ideas and techniques differing from those presented in the earlier volume by Dr. M. E. D. Poore, and is effective in demonstrating the value of computers in various methods of analysis of phytosociological data.

The third is "Litter Production in Forests of the World" by J. R. Bray of the Botany Division of Palmerston North in New Zealand and by E. Gorham of the Botany Department of the University of Minnesota in the United States. Condensed here is a world review of pertinent data, a structural and chemical analysis of litter components, a survey of factors effecting the fall of litter, the seasonal changes in and the magnitude of leaf crops, and a study of leaf litter as an index to net production. It is forecast that in the future forest litter may assume additional significance - as a source of food protein by chemical extraction for the world's expanding populations and as a site for cultivating huge crops of edible fungi, while waiting for the overhead forests to mature.

The fourth is "Forty Years of Genecology" from J. Heslop-Harrison of the Department of Botany of the University of Birmingham in England. This work deals with genecological categories, technique and differentiation, with the evolutionary aspects of this differentiation through the origin, storage and release of variations, and with the physiological aspects of such differentiation through edaphic adaptions to soil moisture stress, to light intensity and to climate. In his conclusion he emphasizes that genecology is a distinct synthetic discipline culled from genetics, taxonomy and plant physiology that should not be assimilated into taxonomy.

NOTES ON LAURACEAE OF TROPICAL AMERICA
I. THE GENERIC STATUS OF NECTANDRA, OCOTEA AND PLEUROTHYRIUM

Caroline K. Allen

Recent collections from the tropics, particularly from South America, have made available materials that in the course of study contributed much towards clarification of our concept of the genera of Lauraceae. It seems appropriate at this point to discuss some of the problems encountered in one of the most controversial areas of the family. Ocotea Aublet and Nectandra Rolander ex Rottboell, wide-spread genera of the tropics of the western hemisphere, represent approximately half of the known species of this region; Pleurothyrium Nees ex Lindley (1836, p. 442)* is a small genus of about twenty species, occurring in northern South America, predominantly in Peru.

A study of the available types in conjunction with pertinent literature shows that taxonomists in general have had a more or less clear concept of Nectandra and Ocotea. Pleurothyrium, however, has been a problem. Careful consideration of the material available, involving a re-evaluation of the literature concerning these genera, leads me to the following conclusion: to date, there is valid reason for maintaining the full generic status of Nectandra and Pleurothyrium apart from Ocotea. It is the comparatively little-known Pleurothyrium that I wish to discuss here. Recent studies of the genus have shed light on staminal structures which, though obviously seen and understood by early students of the family, have not always been clearly described. Until the last quarter century, no adequate illustrations were published.

In general, monographers and authors of floras, following the original description of Nees (1836, pp. 23, 24, 349-351), have accepted Nees' decision in placing Pleurothyrium in Tribe VIII. Dicypellia. The members of the genus are mentioned as trees or shrubs, with sparse, alternate, evergreen, coriaceous,

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* Pleurothyrium, from the Greek words meaning "side" and "little openings" because of the small, lateral valves of the anthers observed particularly in stamens of the first two series.

penninerved leaves, often ferruginous beneath. The inflorescences have been variously described as axillary or terminal, paniculate or thyrsoid, with deciduous bracts; the flowers hermaphrodite, with a 6-parted perianth, coriaceous or fleshy, the lobes (deciduous in fruit) more or less spreading, oblong, the tube obconic; the fruit a berry, immersed, at least in the young state, in the suburceolate tube of the perianth, with spreading-crenate margin. *

Nees has described the perianth of the genus as having 6 "persistent, glandulose lobules" alternating with the lobes of the perianth; 9 perfect stamens, similar structurally, the anthers subcubical, 4-loculed, all of the locules lateral, parallel, ovate, some retrorse, others introrse, the filaments short, the staminodia short, tooth-like, biglandular, the glands originating at the base from the back. **

In the diagnosis of his first-published species of the genus, Pleurothyrium poeppigii, Nees elaborates further his description of the staminal cycles. He notes 6 glands, alternating with the lobes at the height of the stamens, thick, fleshy, glabrous, yellow, contracted from the wide base into an obtuse acumen twice the width of the base, without (in the dried state) showing an indeterminate crease, within furnished with broad, obtuse keels, stretching from the base into the bottom of the flowers; 9 stamens, clustered, short, small compared with the flower, glabrous, the 6 exterior (ser I & II) opposite the lobes of the perianth, the filaments narrow, shorter than the anthers, the anthers subcubical, in the transverse diameter slightly larger, obtuse, the apex bent forward, a little more extrorse, the interior face a little more swollen; lateral locules in pairs, ovate, parallel, subequal, produced from the base almost to the apex, dehiscent by valves from the bottom to the top, the exterior locules of each pair slightly lower and turned about retrorsely, the interior, however, turned introrsely; the anthers of the third or inner cycle (ser III) of stamens conform to those of the rest, the filaments slightly shorter and broader than those of the latter, the glands at the base of these are obsolete or, rather, entirely confluent with the glandular base of the flower.

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*I have not studied fruiting material of this species; nor can I visualize the structure of the fruiting cup here described.

**Biglandular staminodia have not been noted in our material.

Actually, Nees described the floral structure as it appeared to him. The 6 glands alternating with the 6 lobes (the term "tepal" is used for these structures in Lauraceae) of the perianth do not arise from the mouth of the tube, but are attached in pairs to the outer staminal cycles (ser I & II) each gland in the form of an arc seeming to clasp the filament of the stamen from which it arises; on the introrse surface, these glands are often confluent, obscuring those glands which are associated with the other cycle of stamens; the third cycle usually bears smaller glands, more or less obscured by those of the outer cycles; or the glands may be so fused as to lose their identity and thus appear to be lacking altogether. Nees does not elucidate further here on the locules of the anthers.

Under his third species, P. bifidum, Nees states that the stamens form a slender, regular disk surrounded by a broad, 6-sinuate belt of contiguous glands, in the sinuses of which are the 6 outer stamens, the 3 interior stamens surrounding the pistil; the stamens are glabrous, the anthers cubical, the locules ovate, the lateral pairs almost contiguous at the apex, one locule introrse, the other conversely more retrorse. (I take this to mean that, seen laterally, the 2 locules appear one above the other, but in a different vertical plane, the upper introrse, the other extrorse.) Because Nees has not taken into consideration the origin of the tissues of the so-called "disk", his description does not give an accurate picture of the structure or origin of the staminal cycles.

Shortly after Nees' introduction of Pleurothyrium, Endlicher in his Genera Plantarum (1836-40, p. 320) published a diagnosis of the genus essentially the same as that of Nees, except for his interpretation of the staminodia as a fourth staminal cycle. Dietrich (1840, p. 1332) apparently copied Nees; Spach (1841, p. 472), merely assigns the genus to the Tribe Dicypellia.

Meissner (1864, p. 168; 1866, pp. 279-280) refers to an hypogynous disk adnate to the tube of the calyx, the free apex of the disk inflexed above the ovary, forming a narrow ring bearing stamens and glands. The 9 fertile stamens inserted in the orifice on the epigynous ring are free, subequal, and much shorter than the calyx; the 6 outer ones opposite the lobes of the calyx, alternate with the 6 sessile, ovate, flattened glands which are protuberances of the ring;* the anthers are cubical-oblong, truncate,

* This is inaccurate; the glands arise at the base of the filament.

the four locules oval, placed in a nearly horizontal series, the outer facing the sides, the intermediate being slightly higher, facing introrsely in the outer series of stamens, extrorsely in the inner series; staminodia 3, small, triangular, eglandular;** the ovary included entirely in tube, free, ovoid, the style equalling the stamens; the stigma depressed-subcapitate; fruit unknown, undoubtedly surrounded by a truncate cupule provided with a duplicate margin.***

In his treatment of the Lauraceae in Martius' Flora Brasiliensis, Meissner is still preoccupied with the structure of the hypogynous disk in the flower of Pleurothyrium, but at the same time distinguishes the stamens of the third cycle with their pairs sessile glands arising at the base of their filaments. (In some instances, one is able to separate the inner cycle easily from the outer and note the smaller size of the more or less discrete glands of the latter.) Meissner's lengthy description of the anthers does not give a clear image of their structure. He speaks of the four locules being in a nearly horizontal plane but does not mention the parallel vertical planes in this connection.

Baillon (1870, p. 438, 439; 478) is the first author to report the occurrence of a thick obconical receptacle, clothed (with pubescence) within a thick disk which more or less curves at the apex (presumably the glands first mentioned by Nees.) He describes 9 fertile stamens with the perigynous perianth inserted outside the margin of the disk; the 6 outer alternating with the lobes of these; the 3 inner (ser III) biglandular at the base; the filaments thickish, the anthers thick, cubical-oblong, their four locules placed in series at length almost horizontal; the exterior sublateral, the intermediate (locules) situated slightly higher facing, in the 6 outer series, introrsely, in the interior (ser III), extrorsely, the 3 sterile staminodia (ser IV), small or none; ovary free, included in the receptacle; the berry surrounded by the receptacle, developed in fruit, truncate at its apex. Baillon believes that Pleurothyrium differs from Nectandra in minor or secondary characters only.

**Meissner's is the first mention of the staminodia being eglandular.

***The suburceolate calyx surrounding the young fruit frequently bears the remains of the lobes and staminal cycles; this condition might give rise to the impression that the margin of the mature cupule would be double.

A consideration of the foregoing reveals the fact that the "disk" carried through literature for the past century and a half is made up of glands arising from the bases of the six stamens (ser I & II) of the two outer cycles which have become confluent through the pressure of growth. The sinuses of the disk, mentioned by Nees in his description of P. bifidum, are relics indicating the points of separation of the once discrete glands. In addition, there is the convex pubescent projection (the obconical tube mentioned by previous authors) on which seemingly the ovary, the three cycles of stamens with their associated glands and the staminodia, all of which cycles actually arise from the "epigynous" ring of Meissner which, if it is not a true hypanthium, is analogous to the latter structure.

Bentham and Hooker (1880, p. 159) accept Meissner's interpretation of the narrow ring formed by the hypogynous disk.

Mez (1889, p. 468) seemingly was the first student of the Lauraceae to understand the structure and origin of the "disk" mentioned by previous authors. In his key, he separates Ocotea and Nectandra from Pleurothyrium by the presence in the latter of 2 frequently confluent glands at the base of all stamens. He describes the 4-loculed anthers as subcapitate, the 2 upper loculles of the 2 outer series of stamens (ser I & II) introrse, the 2 lower, extrorse or rarely laterally dehiscent; the 2 upper locules of ser III, laterally dehiscent and the 2 lower introrse. To my knowledge, the fruit has not been noted since Nees spoke of a "berry" in the early stages of development.

Mez observed that the singular genus, closely associated to none, is easily and naturally separated by nature of the glands and anthers. He notes three species which seem to show affiliation with Pleurothyrium. Ocotea undulata and Nectandra trianae, both calling to mind the structure of the anthers of Pleurothyrium; but they appear distinct because of the lack of glands of the stamens of ser I & II; and Ocotea bahiensis which, provided with eighteen glands, shows an entirely different form of anthers.

Pax (1889, p. 116), on the other hand, still adheres to the theory of the fleshy disk surrounding the filaments at their base and spearated into six teeth alternating with the stamens.

Species were described by O. C. Schmidt (1928, p. 235) with "all stamens surrounded at base by two large, confluent glands, the anthers subrectangular...."

Macbride (1938, pp. 929-931) in his Flora of Peru gives only a basic generic description which differs from previous treatments in stating that the perianth tube is rarely well defined. Apparently he has not seen the fruit described by Nees. Since Nees' publication, Macbride seems to be the first to question the validity of the genus Pleurothyrium in relation to Ocotea.

Lasser (1942, pp. 118-19) published descriptions of two species from Venezuela in which he describes the anthers as subglobose. An illustration of Pleurothyrium reflexum shows a lateral (or profile) view of a stamen of the outer series--the first depicting the actual structure of the stamens of the genus.

The important contributions of Kostermans (1952, 1957) are discussed at the end of this paper.

Hutchinson (1964, p. 138) separates Pleurothyrium from the rest of the tribe Cinnamomi by: Flowers bisexual; staminodia of the 4 cycle present, thickened at the apex; disk well-developed, 6-lobed. His description goes back to Nees' diagnosis of P. bifidum.

Of the early students of the Lauraceae, only Nees and Meissner made any attempt to describe the differences that they observed that prompted them to recognize Pleurothyrium. I have gone into the history of their treatments at such great length because, inspite of the lack of clarity of their descriptions, and the lack of any supporting illustrations, both of these taxonomists recognized an entity distinct and separable from Nectandra and Ocotea. The latter genera are, for the most part, as I hope to demonstrate in a forth-coming paper, distinct from each other.

In his Historical Survey of the Lauraceae, Kostermans (1952, pp. 22(121), 23(122)) brought the history of Pleurothyrium up to date. Because he considered the character (the number of glands) used by Mez to delimit Pleurothyrium to be of no generic value, he has reduced the latter to Ocotea. Mez and Kostermans agree that the position of the anther locules, likewise, is of no generic value. But, both failed to take into account the strongest character brought out by Nees--the consistently distinctive shape of the anthers which separates the two genera.

Subsequently, Kostermans (1957, p. 39) has seen fit to combine all three genera, Ocotea, Nectandra and Pleurothyrium under Ocotea. If we accept this reduction, the entire taxonomic fabric

of the Lauraceae will be further imperiled; for elsewhere in the family there are several instances where reasons equally strong can be found for combining genera hitherto maintained as distinct entities by all students of the Lauraceae.

To summarize: I continue to maintain the three genera Ocotea, Nectandra and Pleurothyrium. The accompanying figures show the essential differences in the staminal cycles of the three taxa. The characters that I believe to be useful and valuable appear in the following key. Until the fruit of Pleurothyrium becomes well known, the key must, unfortunately, be based entirely on floral characters supported by secondary characters. Only when flowers and fruits of the known species are collected from the same tree can we be sure of obtaining the essential data.

KEY TO THE GENERA

NECTANDRA, OCOTEA AND PLEUROTHYRIUM

1. Stamens (with one known exception) of ser I & II without glands; anthers of ser I & II when viewed laterally more or less falcate, their four locules occurring on the introrse surface.

2. One pair of locules in the upper half of the anther, the other pair in the lower (introrse view) ..... OCOTEA

2. Four locules in ascending arc formation (introrse view; ser I & II); in descending (reverse) arc formation, upper pair lateral, lower pair extrorse (extrorse view; ser III ..... NECTANDRA

3. Anthers ovate, fleshy, papillose, attentuate; connective tissue abundant.... Section Pomatia

3. Anthers usually broader than long, transversely oblong or subreniform; connective tissue absent; locules occupying entire anthers .... Section Porostema

1. Stamens (with two known exceptions) of ser I, II & III with glands; anthers of ser I & II inclined, oblong, approximately isodiametric; the upper pair of locules directed inward, the lower pair, outward, but viewed laterally one of each pair visible ..... PLEUROTHYRIUM

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EXPLANATION OF PLATE

Fig. I. Pleurothyrium

Ze, stamens, ser I & II, ventral.
Ze', stamens, ser I & II, dorsal.
Ze", stamens, ser I & II, lateral.

Zf, stamens, ser III, ventral.
Zf', stamens, ser III, dorsal.
Zf", stamens, ser III, lateral.

Fig. II. Ocotea

Ae, stamens, ser I & II, ventral.
Af, stamens, ser III, ventral.
Af', stamens, ser III, dorsal.
Af", stamens, ser III, lateral.

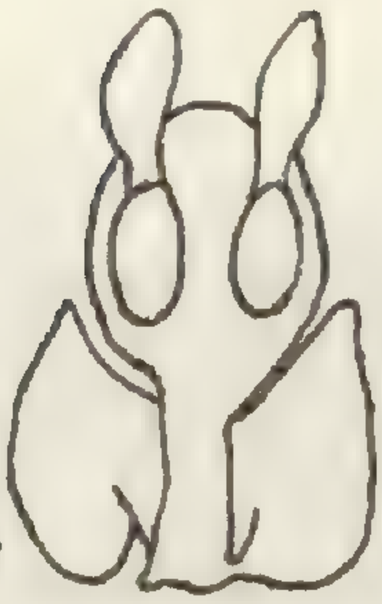
Fig. III. Nectandra Section Pomatia

Ze, stamens, ser I & II, ventral.
Zf', stamens, ser III, ventral.
Zf', stamens, ser III, dorsal.
Zf", stamens, ser III, lateral.
Zg, staminodium, ser IV, ventral.

Fig. IV. Nectandra Section Porostema

Ze, stamens, ser I & II, ventral.
Zf', stamens, ser III, ventral.
Zf', stamens, ser III, dorsal.
Zf", stamens, ser III, lateral.
Zg, staminodium, ser IV, ventral.

Ze'

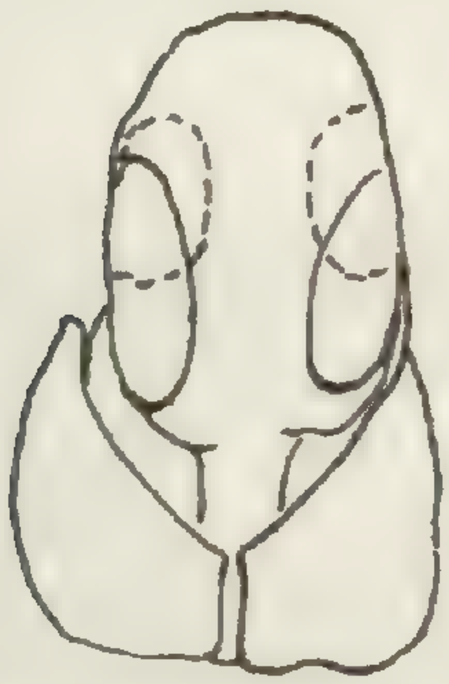


Ze

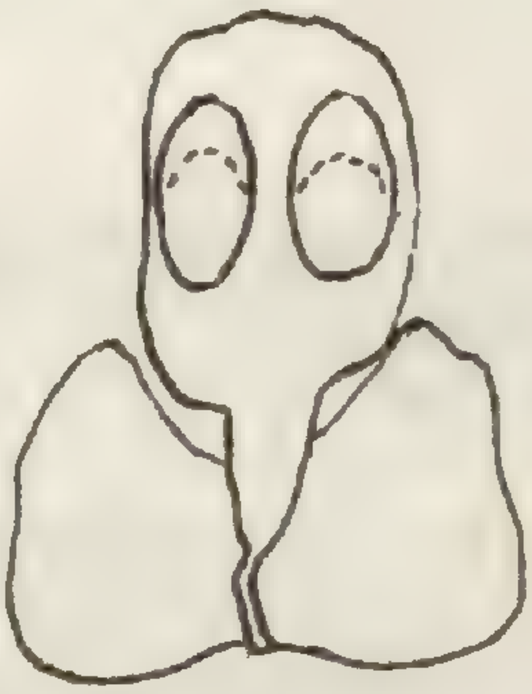
Ze"

Zg'

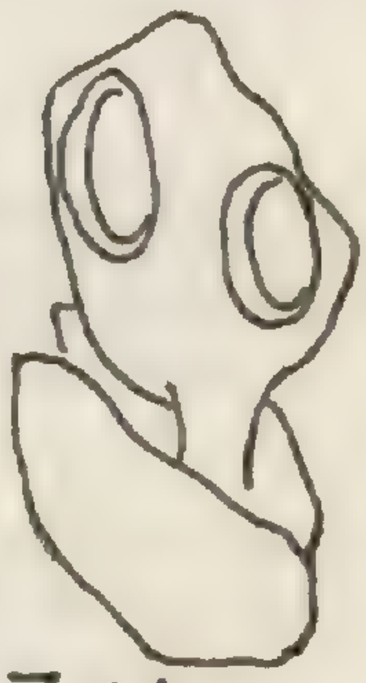
FIG I



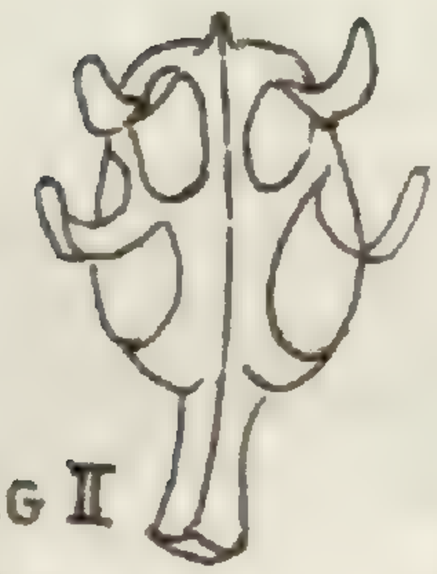
Zf'



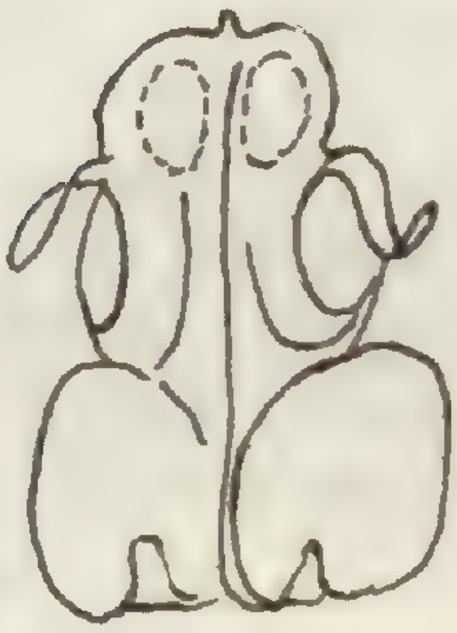
Zf



Zf"



Ae



Af'

Af

Af"

FIG II

Ze

Zf'

Zf

Zf"

FIG III

Ze

Zf'

Zg

Zf"

1mm

FIG IV

NOTES ON TROPICAL AMERICAN LAURACEAE

II. COSTA RICA

Caroline K. Allen

Ocotea skutchii C.K. Allen, Jour. Arnold Arboretum 26: 352.1945

Ocotea williamsii P.H. Allen, Rainforests of Golfo Dulce 410, pl. 27. 1956.

Distribution: Known only from Costa Rica.

Costa Rica: San José: Vicinity of El General, Skutch 3062 (fl., type, GH: isotype, NY); Puntarenas: forested hills near Golfito de Golfo Dulce, Paul H. Allen 5983 (fl., fr. isotype (US).

The distinguishing features by which Paul Allen recognized his new species were the extremely large, oblong or ellipsoid fruits and the axillary tufts of hair that occurred abundantly on the lower leaf surface. Only the cupule of Ocotea skutchii was available at the time of publication, but according to the description, it is identical with that of O. williamsii. The tufts of hair on the lower surface of the leaves do not appear onclose examination to be the usual type of pubescence found in the glands of many species of Lauraceae. Possibly they represent an epidermal growth induced by insect attack near the primary and frequently the secondary nerves.

The flowers available from the type number proved to be abnormal in structure, a condition which could also be the result of insect infestation.

However, the general habit of growth of the branchlets, the twigs and the leaves with long-decurrent blades simulating a long petiole are the same in both types. The greenish yellow color of the specimens in the dried state presents a striking background for the bright yellow venation, another character in common. Both are trees over eighty feet in height.

Research for these studies was carried out at the New York Botanical Garden with the assistance of the National Science Foundation (Grant No GB-3048), whose generous support made its publication possible.

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C. 1

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SYSTEMATIC NOTES ON MICRONESIAN PLANTS. 2.

by F. R. Fosberg

This series is designed to present material preliminary to a Flora of Micronesia (in preparation) and to validate names used in that Flora so they can be used now. (For No. 1 see Phytologia 5: 289-292, 1955). The present number contains notes and new combinations in the Piperaceae.

PIPERACEAE

The family Piperaceae is inherently a very difficult one, as are most families with reduced or simplified floral structure and many species. There is no doubt that a large number of species exist in the two principal genera, Piper and Peperomia. It was probably inevitable that the earlier workers in such a group that is common and widespread should tend to describe many species that appeared distinct on the basis of a few specimens, and that subsequent species should have been set up on similar characters. These would probably tend to fill in the gaps and the species to run together. In such a case, it is a natural tendency to continue to describe new species rather than to look critically at the increasing difficulties in telling them apart. One gets the impression that, in the Piperaceae at least, it became the course of least resistance to describe any specimen that gave trouble as new, rather than to struggle with the problem of identifying it.

Even Yuncker, who had no hesitation in combining weak species that he had studied in the field, had great compunction in reducing those that he only knew from dried material and especially those known to him from descriptions only. He also became accustomed to using the trifling characters employed by his predecessors, such as slight differences in leaf shape, pubescence, and habit, and ascribed perhaps too much importance to them.

In working over the relatively few Micronesian species for the Flora of Micronesia, the trivial nature of some of the features used to separate them became very evident, and attempts to construct a usable key were frustrating.

Some of these problems are more or less alleviated by combining species where they do not seem to represent morphologically distinct populations. To some extent this is done below. However, even this leaves certain species very difficult to separate in the field. Further field study may eventually indicate

that Peperomia glassmanii, P. kusaiensis and P. breviramula should be combined, and that Peperomia ponapensis, and P. kraemeri are cospecific with P. mariannensis. I hesitate, however, to make these reductions without an opportunity to look again at the plants in the field, now that I have better understanding of the characters that purport to separate them.

The reductions made below are discussed individually. The nomenclatural status of Piper methysticum Forst. f. is also considered. The species of Piper recognized from Micronesia in the present treatment are mostly very distinct and easily separated if fertile material is available.

PIPER L.

PIPER BETLE L., Sp. Pl. 28, 1753.

Even a cursory examination of a series of specimens of this widely planted and subspontaneous species from any part of its range shows that it is a complex of forms which seem to have little significance, although they are by no means all found throughout the range of the species. To disentangle these for the whole species would be a larger undertaking than I am prepared to attempt here. However, there seem to be three discernible entities in Micronesia, although Professor Yuncker in his treatment of the Micronesian Piperaceae (Occ. Pap. Bishop Mus. 22: 83-108, 1959) admitted only two, and those at the varietal level.

Since the differences are only trivial ones, mainly in leaf outline and presence or absence of puberulence on the nerves, and since there is no clear geographical separation, I prefer to treat the variations as formae. The necessary combinations, synonymy, and distinguishing characteristics are as follows:

PIPER BETLE L. f. BETLE

Piper betle L., Sp. Pl. 28, 1753.

Stems striate-angulate, leaf blades oblong-ovate, base oblique, subcordate or only slightly cordate, glabrous.

This seems to be the plant indicated by Linnaeus in Flora Zeylanica 11-12, 1747, which I take to be the main basis for the Species Plantarum treatment. Therefore the type locality is undoubtedly Ceylon, in spite of being indicated by Linnaeus as India.

In Micronesia this form is found in the Marianas and is known from Agrigan, Alamagan, Saipan, Rota and Guam islands.

PIPER BETLE f. MARIANUM (Opiz) Fosberg, stat. nov.

Piper marianum Opiz in Presl, Rel. Haenk. 1: 159, 1828.

Piper betle var. mariannum /sic/ C. DC. in DC., Prodr. 16(1): 360, 1869.

Piper potamogetonifolium Opiz in Presl, Rel. Haenk. 1: 156, 1828.

Stems terete, leaf blades glabrous beneath, broadly ovate-cordate, basal sinus deep, base not conspicuously oblique, apex notably acuminate.

Opiz' description of P. potamogetonifolium fits this form. The basis of the statement by Safford (Contr. U.S.N.H. 9: 355, 1905) that this plant is an "undershrub" is unknown, as Opiz gives no information as to habit. Piper betle is a climber.

In Micronesia f. marianum is known only from Saipan and Guam, in the Marianas.

PIPER BETLE f. DENSUM (Bl.) Fosberg, stat. nov.

Piper densum Bl., Verh. der Bat. Genoots. 11: 193, 1826.

Piper betle var. densum (Bl.) C. DC. in DC., Prodr. 16(1): 360, 1869.

Stems terete, leaf blades puberulent beneath, especially on the nerves, broadly, somewhat irregularly, ovate cordate, with deep basal sinus, not or slightly oblique.

Yuncker, op. cit. p. 90, has referred the puberulent Micronesian specimens here. We have not seen Blume's type, which came from Java. A specimen collected in Barrigada Village, Guam (Stone 5126) is almost imperceptibly puberulent, or papillate.

In Micronesia f. densum is known from Alamagan and Guam in the Marianas, and Palau, Yap and probably Ponape in the Carolines.

PIPER GUAHAMENSE C. DC. in DC., Prodr. 16(1): 336, 1869.

Typically this species, in Guam, is somewhat puberulent or hirtellous on the under sides of the leaves and on younger parts. In the islands to the north--Rota, Tinian, and Agrigan--it is glabrous. A glabrous plant has also been collected on Guam. Yuncker (1959) described the glabrous form as var. glabrum.

Although the ranges of the puberulent and glabrous plants are partially distinct, the trivial nature of the difference would suggest the rank of forma for them. The sheet of G.E.S. 387 in the U.S. National Herbarium is puberulent, while the sheet of the same collection in the Bishop Museum is glabrous and was part of the basis for Yuncker's variety. The latter sheet is the only basis for ascribing the glabrous form to Guam. However, there seems to be no reason to suspect an erroneous locality for the sheet.

PIPER GUAHAMENSE C.DC. f. GUAHAMENSE

Known only from Guam.

PIPER GUAHAMENSE f. GLABRUM (Yuncker) Fosberg, stat. nov.

Piper guahamense var. glabrum Yuncker, Occ. Pap. Bishop Mus. 22: 87, 1959.

Known from Guam and the Marianas Islands north of Guam.

PIPER LATIFOLIUM L. f., Suppl. Pl. 91, 1781.

Piper micronesiacum Hosokawa, Trans. Nat. Hist. Soc. Formosa 32: 387, 1942.

Kusaie, Mt. Keies, Mallens, Hosokawa 9498 (A,US, isotype)

This collection, i.e., type of P. micronesiacum Hos. was referred to P. guahamense by Yuncker, and tentatively by me. It differs in having several spikes in an axil and in being less prominently puberulent.

A. C. Smith's excellent discussion of P. latifolium and its allies (Jour. Arn. Arb. 24: 349-351, 1943) suggested looking at P. latifolium, of the South Pacific, from the Marquesas, Society, and Cook Islands west to the New Hebrides, for a plant with several spikes in an axil. Smith shows that P. latifolium is rather variable, from glabrous to puberulent on petioles and lower leaf surfaces, with petioles from about one-third to almost completely vaginate.

Material available for comparison in the U. S. National Herbarium, from Tahiti, Rarotonga, Rurutu, and the New Hebrides, mostly studied either by Smith or by Yuncker, illustrates very well this variation. The Hosokawa 9498 collection falls well within the range of variation of this material, though it is hard to compare in leaf shape, as the leaves are folded and badly pressed. It is puberulent, though less so than Grant 214

from Tahiti. The leaf blades seem slightly narrower than those of some of the South Pacific specimens, and more strongly acuminate. The petioles are from one-third to two-thirds vaginate. In other respects it matches P. latifolium, and I have now no hesitation in referring it to that species, and thus placing P. micronesiacum in the synonymy of P. latifolium. This also extends the range of P. latifolium to Micronesia. When further collections are available from Kusaie, as well as from other parts of its range, it will doubtless be possible to separate varieties or forms in this species.

PIPER HOSOKAWAE Fosberg, nom. nov.

Piper decumanum var. palauense Hosokawa, Trans. Nat. Hist. Soc. Formosa 28: 153, 1938 (non Piper palauense Hosokawa 1935)

This species was first referred to P. majusculum Bl. of Java, by Kanehira, Enum. Micr. Pl. 305, 1905. Hosokawa described it as a variety of P. decumanum L., a Moluccan and Philippine species (the name of uncertain status). It is certainly closely related to these, especially the latter. However, as species of Piper go, it seems distinct enough. It differs in its broader, much less oblong leaves, with weaker and somewhat fewer nerves, all of which arise near the base, rather than one pair from well above the base, the secondary veins, rather than extending across from one main nerve to another in a ladder-like arrangement, are well marked where they start from one nerve toward the side, but split part way across and form an anastomosing network. Hosokawa's description was very brief, contrasting it with P. decumanum. More details may be worth recording, though little material is now at hand from which to do this. Quite a few sheets were examined earlier, from Kyushu University and the Bishop Museum, but it was not realized then that the plant was so distinct from P. decumanum, so not much was recorded. These sheets are not cited below.

The leaves are broadly ovate-cordate, tending slightly to be oblong, to at least 27 x 15 cm, deeply cordate, oblique, basal lobes sometimes overlapping, petiole about 3 cm long, winged part way up; pistillate spike elongate, about 6 cm thick, ovaries conspicuously drawn out to a neck at summit, stigmas 3, tomentulose, spreading, pointed.

Endemic to the Palau Islands, so far as known.

Caroline Islands, Palau: Peliliu, Hosokawa 9226 (A, BISH, isotype); Akoru-kaigan, Hosokawa 7098 (A, BISH).

Named for Prof. T. Hosokawa, of Kyushu University, who has devoted much attention to Micronesian Piperaceae.

PIPER METHYSTICUM Forst. f.,De Pl. Esc. Oc. Austr. 76: 1786.

The name Piper methysticum has been almost universally applied to the widespread Pacific shrub with leaf-opposed spikes from which the Polynesians, some Melanesians, and the eastern Carolinians of Micronesia make or made a drink called variously kava (Polynesia), yangona (Fiji) or sakau (Ponape). The root is also a pharmaceutical item in some western countries.

The existence of an earlier effectively published Piper methysticum L.f. (Suppl. Pl. 91, 1781) raises the question of the legitimacy of Foster's name. Linnaeus filius published P. methysticum with a description, applying clearly to a species with axillary spikes. In an emendandum at the end of the volume he says, "Pag. 91. Piper methysticum lege Piper latifolium."

J. W. Moore (Occ. Pap. Bishop Mus. 10(19): 3-4, 1934) dealt with this question. He chose to accept an author's right to correct his own errors and suggested regarding P. methysticum L.f., thereby, as never having been published at all, leaving us free to use P. methysticum Forst. f.

A. C. Smith (Jour. Arn. Arb. 24: 349, 1943) and Merrill (Bot. Cook's Voy. 357, 1954) following him, considered that P. methysticum L.f. was in synonymy, therefore not validly published.

This is certainly a practical and in this case, at least, an acceptable solution. It is necessary, however, to examine the case in terms of the present International Code of Botanical Nomenclature, especially to determine carefully whether or not P. methysticum L.f. constitutes an earlier homonym of P. methysticum Forst. f.

If the earlier of the two names is regarded as validly, as well as effectively, published, then whether or not the author is permitted to correct his "error", it is an earlier homonym. There is in Art. 73 of the Montreal Code limited authority to correct orthographic errors. However, this is in no sense an orthographic error, so Art. 73 does not apply. The best way under the Code, to permit such corrections made by the author at the time of original publication, seems to be to invoke Art. 34, provision No. 1, which says, "A name is not validly published (1) when it is not accepted by the author who published it." Linnaeus filius' instruction to the reader,in the emendandum, to read P. latifolium for P. methysticum can logically be considered as rejection, hence non-acceptance of the latter name. Therefore, it is not validly published and cannot be regarded as published at all

in the sense of the Code. Hence it is not an earlier homonym of P. methysticum Forst. f., which we may continue to use in its traditional sense.

PEPEROMIA R. & P.

PEPEROMIA MARIANNENSIS C.DC., DC. Prodr. 16(1): 442, 1869.

Peperomia guamana C.DC., Phil. Jour. Sci.Bot. 9: 72, 1914.

Although there is a considerable range of variation in a number of characters in the Peperomia population of the Marianas, there seems to be little correlation between these variations. P. guamana has been maintained as distinct from P. mariannensis on the basis of opposite, obtuse leaves in the latter, vs. alternate acute ones in P. guamana. However, the isotype sheet of P. guamana in USNH has predominantly opposite, though acute, leaves as has Bryan 1116 (NY). Hosaka 3008 (BISH) is about intermediate in both characters, and could easily be referred to P. mariannensis though Yuncker called it P. guamana. Stone 4713 has opposite, mostly acute leaves.

The conclusion, after examination of a good series of specimens, is that only one species is represented in the Marianas. Its correct name is P. mariannensis C.DC. Dr. B. C. Stone (ms. 1966) has quite independently arrived at the conclusion that these two species should be combined.

As Yuncker has pointed out, plants of this species from the northern Marianas tend to be larger in stature than those from Guam. However, this is only a tendency and is correlated with nothing else. I agree with Yuncker in not regarding it as meriting taxonomic recognition.

Distinction from P. kraemeri C.DC. is a more difficult problem. About the only differences seem to be the smaller generally obtuse leaves and shorter spikes of P. kraemeri. However, I have had little chance to study the glabrous Palau material referred here. It seems also very close to P. palauensis C.DC., so that reduction might require bringing the latter in, too. So for the present these may be regarded as three very closely related species. Glabrous plants from Palau referred by Yuncker to P. guamana seem to fit in P. kraemeri with no difficulty and are so disposed of here. Part of Fosberg 25869, from Urukthapel, Palau, is appressed hirtellous and seems to belong to P. palauensis, the glabrous remainder to P. kraemeri.

PEPEROMIA MARIANNENSIS C. DC. f. MARIANNENSIS

Peperomia mariannensis C. DC., sensu stricto.

This form is known from Agrigan, Pagan, Alamagan, Sarigan, Saipan, Tinian, Agiguan, Rota, and Guam.

PEPEROMIA MARIANNENSIS f. SAIPANA (C. DC.) Fosberg, comb. nov.

Peperomia saipana C. DC. in Merr., Phil. Jour. Sci. Bot. 9:72, 1914.

Peperomia guamana var. saipana (C. DC.) Yuncker, Occ. Pap. Bishop Mus. 14(2): 15, 1938.

A form with hirtellous stems occurs on Saipan and possibly Tinian (Hosokawa 8023, cited by Yuncker as from Pagan, is really from Saipan according to an itinerary supplied by Professor Hosokawa). This was originally proposed as a species by C. de Candolle, reduced to varietal rank by Yuncker, but seems nothing more than a form, since it differs only in the slight hairiness and has no discreet geographic range, as f. mariannensis also occurs on Saipan and Tinian.

C. de Candolle, in his original descriptions of P. saipana, said specifically that it is glabrous. If this were the case, it would be strictly a synonym of f. mariannensis and a new name would be needed for the hirtellous form. However, Yuncker examined the type of P. saipana in the Berlin herbarium, now presumably destroyed. Since he then used the epithet saipana for the hirtellous plant, we may, I think, safely assume that the Fritz specimen that de Candolle described was hirtellous.

PEPEROMIA PONAPENSIS C. DC., Bot. Jahrb. 56: 504, 1921.

Peperomia volkensii C. DC., op. cit. p. 503.

Peperomia gibbonsii C. DC., op. cit. p. 504.

What have been regarded as three species, all glabrous, have been recognized from low elevations in the eastern Caroline and Marshall Islands. I have collected two of them and have been struck by their similarity in habit and appearance, as well as in habitat. P. ponapensis is found on the basalt ruins at sea level at Matalanim, Ponape, as well as under atoll conditions in several of the Marshall Islands. P. volkensii grows on the similar basalt ruins in Kusaie at Lele, and has been reported from Ebon Atoll, southern Marshalls. P. gibbonsii was originally described from Ailinglapalap, in the Marshalls, supposedly from "basalt" rocks (an impossibility in the Marshalls, which are all coral).

Dried specimens of P. ponapensis and P. volkensii differ only in that those of P. volkensii have the leaves more predominantly opposite, but both species have both opposite and alternate on the same plant. Both have a tendency to have a branch (or at least a leaf scar (P. ponapensis) opposite a leaf where the leaves are alternate.

An examination of Yuncker's descriptions of the two shows that they are essentially identical except that P. volkensii has the leaves predominantly opposite while P. ponapensis has them predominantly alternate.

P. gibbonsii has not been recollected since the original gathering. The characters cited as differentiating it from P. ponapensis at first sight seem impressive. However, Yuncker's illustration of the type does not suggest that the spikes are much more "umbellate" or paniculate than those of some specimens of P. volkensii (Fosberg 26538) or of P. ponapensis (Hatheway 849, Glassman 2650, Fosberg 34027, Anderson 3745, etc.). Yuncker (1938) says P. gibbonsii has "stigma divided to form two fleshy, pilose pads" while in 1959 he says of P. gibbonsii "Bilobulate stigmas occur not infrequently among other species, but this character is especially noticeable in the type specimen of this species." Unfortunately this specimen was probably lost with the Berlin Herbarium during World War II.

There seems to be little point in straining to keep these populations as separate species, or even separate varieties, if they appear to be the same thing and must be distinguished by such inconstant features as have been used heretofore. Hence I am regarding the names as synonymous. All three were published simultaneously and, because P. ponapensis has been the most widely used name, it is here chosen for the combined species.

PEPEROMIA PONAPENSIS C.DC. var. PONAPENSIS

Peperomia ponapensis C.DC. sensu stricto

Found in the eastern Carolines (Ponape, Pingelap and Kusaie) and central to southern Marshalls (Lae, Ailinglapalap, Arno, Jaluit and Ebon atolls). The records from the Marianas (Saligan and Saipan) admitted by Yuncker are here referred to the very similar P. mariannensis.

PEPEROMIA PONAPENSIS var. TRUKENSIS (Yuncker) Fosb. comb. nov.

Peperomia trukensis Yuncker, Occ. Pap. Bishop Museum 14: 23-24, 1938.

A more or less hirtellous but otherwise entirely similar plant from Truk and the Jokaj Peninsula on Ponape seems to belong to this species also, though it has heretofore been regarded as a distinct species. The stems, leaves and peduncles are very sparsely to densely beset with short, straightish, subappressed to spreading hairs, and the leaf margins are ciliolate all the way around. It is here regarded as a variety of P. ponapensis.

NOTES ON NEW AND NOTEWORTHY PLANTS. XLIV

Harold N. Moldenke

BOUCHEA BOYACANA var. GLABRATA Moldenke, var. nov.

Haec varietas a forma typica speciei ramis ramulisque minutissime puberulis vel glabratis inflorescentiis minutissime puberulis recedit.

This variety differs from the typical form of the species in having its branches, branchlets, and leaves only most minutely and obscurely microscopically puberulent or glabrate and its rachis and calyxes very minutely microscopically puberulent.

The type of the variety was collected by Paul C. Hutchison and J. Kenneth Wright (no. 6592) along roadsides on desertic steep slopes, at an altitude of 2050 meters, in the vicinity of Huancabamba, between there and Sondorillo, in the province of Huancabamba, Piura, Peru, on September 14, 1964, and is deposited in the H. N. Moldenke herbarium at Plainfield, New Jersey. The collectors describe the plant as an herb to 3/4 of a meter tall, with blue flowers.

CALLICARPA JAPONICA f. ALBIFLORA Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Ernest Henry Wilson (no. 10444) at Kongo-san, in the province of Kogen, Korea, at 330 meters altitude, on July 5, 1918, and is deposited in the United States National Herbarium at Washington. The collector notes "one bush seen".

CITHAREXYLUM FRUTICOSUM f. BAHAMENSE (Millsp.) Moldenke, stat. nov.

Citharexylon bahamense Millsp. in Britton, Bull. N. Y. Bot. Gard. 3: 450—451. 1905.

LANTANA MINASENSIS var. LONGIBRACTEOLATA Moldenke, var. nov.

Haec varietas a forma typica speciei bracteolis usque ad 1 cm. elongatis recedit.

This variety differs from the typical form of the species in its elongate bractlets, the outermost being to 1 cm. in length.

The type of the variety was collected by Alberto Castellanos (no. 24984) at Muriaé, Minas Gerais, Brazil, on July 7, 1964, and is deposited in the H. N. Moldenke herbarium at Plainfield, New Jersey.

STACHYTARPHETA CAJAMARCENSIS Moldenke, sp. nov.

Suffrutex, ramis acute tetragonis perspicue alato-marginatis dense griseo-pubescentibus; foliis oppositis ellipticis vel lan-

ceolato-ellipticis acutis, ad basin in petiolum longe acuminatis, utrinque dense puberulis; inflorescentiis terminalibus solitariis usque ad 15 cm. longis densissime multifloris percrassis robustis valde multibracteolatis densissime albido-hirsutis; bracteolis valde perspicuis numerosissimis valde divergentibus ca. 2 cm. longis oblongis ad apicem attenuatis et in juventute valde recurvatis.

Subshrub; stems and branches acutely tetragonal, conspicuously alate-margined, densely grayish- or brownish-pubescent throughout; nodes abbreviated, 1—3 cm. long, the lowest to 7 cm.; leaves decussate-opposite, sessile or subsessile, thin-chartaceous, grayish-green, somewhat lighter beneath, elliptic or lanceolate-elliptic, to 7 cm. long and 3 cm. wide, acute or obtusish at the apex, regularly sharp-serrate along the margins almost to the base, long-acuminate at the base into what could be called a margined short petiole, densely puberulent on both surfaces; midrib slender, flat above, slightly prominulous beneath; secondaries slender, numerous, close, 7—10 per side, arcuate-ascending, flat above, hardly prominulous beneath; inflorescence spicate, terminating each stem and branch, sessile or very short-pedunculate, stiffly erect, very heavy and robust, very densely many-flowered, to 15 cm. long and 3 cm. wide, very conspicuously bracteolate, densely white-hirsute; bractlets very conspicuous and numerous, oblong-linear, about 2 cm. long, 1.5—2 mm. wide, long-attenuate at the apex, widely divergent, arcuately recurved before and during anthesis, less so after anthesis, densely hirsutulous; calyx cylindric, about 15 mm. long, densely puberulent, hirsutulous on the 5 ribs, the rim sharply 5-toothed; corolla hypocrateriform, its tube about 2 cm. long, the limb about 1 cm. wide.

The type of this distinctive species was collected by Paul C. Hutchison and J. Kenneth Wright (no. 3645) in a niche at the base of a granite cliff, Rio Chamaya, 166 km. east of Olmos, at an altitude of 700 meters, in the province of Jaen, Cajamarca, Peru, on January 19, 1964, and is deposited in the herbarium of the University of California at Berkeley.

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ADDITIONAL NOTES ON THE GENUS VERBENA. II

Harold N. Moldenke

VERBENA [Dorst.] L.

Additional and emended bibliography: A. Gray in M. C. Perry, Narr. Exped. China Seas & Japan 2: 316. 1856; Boiss., Fl. Orient. 4: 534. 1879; Aitch., Journ. Linn. Soc. Lond. Bot. 18: 85. 1880; N. L. Britton, N. J. Geol. Surv. Final Rep. State Geol. 2 (1): 194 & 642. 1889; Mrs. W. S. Dana, How to Know Wild Fls., rev. ed., 122, 314—316, 365, 371, & 372, pl. 135. 1896; Stack, Wild Fls.

349—351, 400, & 410. 1909; W. J. Beal, Mich. Agr. Coll. Exp. Sta. Bull. 260: 153, fig. 153. 1910; J. Matsumura, Ind. Pl. Jap. 2 (2): 534. 1912; W. J. Beal, Mich. Agr. Coll. Exp. Sta. Bull. 267, ed. 2, 115, fig. 174. 1915; Sievers, U. S. Dept. Agr. Misc. Publ. 77: 15, fig. 24. 1930; Muenscher, Cornell Agr. Exp. Sta. Bull. 635 [Weeds N. Y.], pr. 2, 10 & 387. 1939; Quick, Wild Fls. North. States 371—373, 375, & 518, fig. 190. 1939; M. J. Cuthbert, How to Know Spring Fls. 110, fig. 297 & 298. 1943; Oswald, Wild Flow. Dossier 1: 20, fig. 3. 1951; Gorsch., Fl. URSS 19: 694. 1953; Kitamura, Fl. Afghan. 327. 1960; Dyer, Verdoorn, Codd, & Letty, Wild Fls. Transv. 280. 1962; Angely, Bibl. Veg. Paran. 80, 136, 195, 196, 236, 242, & 260. 1964; F. H. Montgomery, Native Wild Pl., pr. 2, 121, fig. 209 & 210. 1965; Hocking, Excerpt. Bot. A8: 226—227 (1965) and A9: 364—367. 1965; Buchheim, Huntia 2: 38. 1965; Moldenke, Phytologia 13: 179—218. 1966; Shimners, Sida 2: 266. 1966; Moldenke, Résumé Suppl. 13: 1—3, 6, & 7. 1966; Cody, Ind. Sem. Bot. Gard. Ottawa 1966: 19. 1966; Lourteig, Taxon 15: 30. 1966; Gaiser, Surv. Vasc. Pl. Lambton Co. 100—101. 1966.

VERBENA ABRAMSI Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A9: 367. 1965; Moldenke, Phytologia 13: 181. 1966.

VERBENA AMBROSIFOLIA Rydb.

Additional bibliography: Moldenke, Phytologia 13: 181—182. 1966; Moldenke, Résumé Suppl. 13: 2. 1966.

Crutchfield found this plant growing in "sandy gravelly soil at edge of road" in New Mexico.

Additional citations: NEW MEXICO: Chaves Co.: J. R. Crutchfield 87 (Ld).

VERBENA AMBROSIFOLIA f. EGLANDULOSA Perry

Additional bibliography: Moldenke, Phytologia 13: 182. 1966; Moldenke, Résumé Suppl. 13: 2. 1966.

VERBENA AMOENA Paxt.

Additional bibliography: Moldenke, Phytologia 13: 182. 1966; Moldenke, Résumé Suppl. 13: 2 & 6. 1966.

VERBENA ANDRIEUXII Schau.

Additional bibliography: Moldenke, Phytologia 13: 181 & 182. 1966.

VERBENA ATACAMENSIS Reiche

Additional bibliography: Moldenke, Phytologia 13: 182. 1966; Moldenke, Résumé Suppl. 13: 3. 1966.

VERBENA BIPINNATIFIDA Nutt.

Additional bibliography: Moldenke, Phytologia 13: 180, 181, 183, & 189. 1966.

Recent collectors have found this plant growing in red or in

loose black soil, loose sand, sandy silt, or clay.

Additional citations: TEXAS: Bee Co.: Rios & Cavazos 206 (Ld). Brown Co.: L. Horner 20 (Ld). Coryell Co.: Baize 13 (Ld). Duval Co.: Gonzalez-Arroyo 99 (Ld); F. Guajardo 62 (Ld); E. F. Gutierrez 56 (Ld); Llaguno 81 (Ld). Jim Wells Co.: Gamboa & Dohnke 151 (Ld). La Salle Co.: I. A. Martinez 66 (Ld). Live Oak Co.: Rios & Cavazos 222 (Ld). Medina Co.: Barrera & Laurel 110 (Ld).

VERBENA BONARIENSIS L.

Additional bibliography: Moldenke, Phytologia 13: 184—185. 1966.

Reed found this plant fruiting in November.

Additional citations: ALABAMA: Crenshaw Co.: C. T. Reed 2073 (Ld).

VERBENA BRACTEATA Lag. & Rodr.

Additional bibliography: Muenscher, Cornell Agr. Exp. Sta. Bull. 635 [Weeds N. Y.], pr. 2, 10 & 387. 1939; Hocking, Excerpt. Bot. A9: 367. 1965; Moldenke, Phytologia 13: 185. 1966; Moldenke, Résumé Suppl. 13: 1. 1966; Cody, Ind. Sem. Bot. Gard. Ottawa 1966: 19. 1966; Gaiser, Surv. Vasc. Pl. Lambton Co. 100. 1966.

Recent collectors have found this plant growing in brownish loam on dry and sunny prairies and in sandy soil near the edge of a natural lake in rolling grasslands in New Mexico. The flowers on J. R. Crutchfield 423 are described as "blue".

Additional citations: NEW MEXICO: Colfax Co.: Lucas 164 (Ld). San Miguel Co.: J. R. Crutchfield 423 (Ld).

VERBENA BRASILIENSIS Vell.

Additional bibliography: Moldenke, Phytologia 13: 185—186. 1966; Moldenke, Résumé Suppl. 13: 3. 1966.

VERBENA CAMERONENSIS L. I. Davis

Additional bibliography: Moldenke, Phytologia 13: 186 & 192. 1966.

VERBENA CANADENSIS (L.) Britton

Additional bibliography: Quick, Wild Fls. North. States 373 & 518. 1939; M. J. Cuthbert, How to Know Spring Fls. 110, fig. 297b. 1943; Hocking, Excerpt. Bot. A9: 367. 1965; Moldenke, Phytologia 13: 186—187. 1966.

Additional illustrations: M. J. Cuthbert, How to Know Spring Fls. fig. 297b. 1943.

The Buchoz (1783) colored illustration of this species, cited in my previous work, is unnumbered in the New York Botanical Garden library copy of this work. The flowers on Correll, Correll, & Crutchfield 30903 are described as "lavender" and the plant is said to have been growing on a sandy bank from a woody rootstock.

Additional citations: KANSAS: Labette Co.: Larew Kan.2-180 (Ld). TEXAS: Henderson Co.: Correll, Correll, & Crutchfield

30903 (Ld).

VERBENA CANESCENS H.B.K.
Additional bibliography: Moldenke, Phytologia 13: 187—188 & 216. 1966; Moldenke, Résumé Suppl. 13: 7. 1966.

VERBENA CANESCENS f. ALBIFLORA Moldenke
Additional bibliography: Hocking, Excerpt. Bot. A9: 367. 1965; Moldenke, Phytologia 13: 187. 1966.

VERBENA CANESCENS var. ROEMERIANA (Scheele) Perry
Additional bibliography: Moldenke, Phytologia 13: 187—188. 1966; Moldenke, Résumé Suppl. 13: 7. 1966.

VERBENA CANIUENSIS Moldenke
Additional bibliography: Moldenke, Phytologia 13: 451. 1965; Angely, Bibl. Veg. Paran. 196. 1964.

VERBENA CAROLINA L.
Additional bibliography: Moldenke, Phytologia 13: 188. 1966.
Additional citations: HONDURAS: Copán: Molina R. 12892 (W—2445406).

VERBENA CILIATA Benth.
Additional bibliography: Moldenke, Phytologia 13: 189. 1966; Moldenke, Résumé Suppl. 13: 2 & 7. 1966.
The Llaguno 81 and Rios & Cavazos 206 & 222, distributed as V. ciliata, are actually V. bipinnatifida Nutt., Anda 48 is V. ciliata var. longidentata Perry, and L. R. Cuesta 28 is V. tenuisecta Briq.

VERBENA CILIATA var. LONGIDENTATA Perry
Additional synonymy: Verbena ciliata var. longedentata Perry, in herb.
Additional bibliography: Moldenke, Phytologia 13: 189—190. 1966.
Recent collectors have found this plant growing in sandy loam, sandy or fine sandy silt, and caliche. Material has been misidentified and distributed in herbaria under the name V. cloveri var. cloveri, a name which I never proposed and would never employ! On the other hand, the Barrera & Laurel 110, Gamboa & Dohnke 151, Gonzalez-Arroyo 99, F. Guajardo 62, E. F. Gutierrez 56, and I. A. Martinez 66, distributed as V. ciliata var. longidentata, are actually V. bipinnatifida Nutt., while T. Bruni 12 is V. ciliata var. pubera (Greene) Perry.
Additional citations: TEXAS: Dimmit Co.: Anda 48 (Ld); Chaves, Flores, & Hein 74 (Ld); Guerra, Garcia, & Garcia 32 (Ld). Jim Wells Co.: Sosa 31 (Ld). Webb Co.: Dickey 137 (Ld). Zapata Co.: F. Guajardo 42 (Ld).

VERBENA CILIATA var. PUBERA (Greene) Perry

Additional bibliography: Moldenke, Phytologia 13: 190. 1966.

Recent collectors have found this plant growing in marl or in loose sand. Material has been misidentified and distributed in herbaria as V. quadrangulata Heller.

Additional citations: TEXAS: Jim Hogg Co.: L. Moran 10 (Ld). Maverick Co.: T. Bruni 12 (Ld).

VERBENA CLOVERAE Moldenke

Additional synonymy: Verbena cloveri var. cloveri Moldenke, in herb. Verbena cloveri var. lilacina Moldenke, in herb.

Additional bibliography: Moldenke, Phytologia 13: 190—191. 1966.

Recent collectors have found this plant growing in gravel or in loose red sand. Material has been misidentified and distributed in herbaria as V. halei Small. On the other hand, the F. Guajardo 42, distributed as V. cloverae, is actually V. ciliata var. longidentata Perry, while R. A. Leal 30 is V. plicata Greene.

Additional citations: TEXAS: Duval Co.: C. Cantu 55 (Ld). Jim Hogg Co.: R. Bruno 41 (Ld); Sosa 32 (Ld). Kleberg Co.: Rios & Cavazos 4 (Ld). La Salle Co.: A. Castro 55 (Ld); M. de J. Solis 122 (Ld). Starr Co.: R. M. Navarro 98 (Ld). Webb Co.: Arzola 143 (Ld); Guerra, Garcia, & Garcia 24 (Ld). Zapata Co.: Flores & Powell 112 (Ld); F. Guajardo 37 (Ld).

VERBENA CORYMBOSA Ruíz & Pav.

Additional bibliography: Moldenke, Phytologia 13: 191. 1966; Moldenke, Résumé Suppl. 13: 3. 1966.

xVERBENA DEAMII Moldenke

Additional bibliography: Moldenke, Phytologia 13: 191. 1966; Gaiser, Surv. Vasc. Pl. Lambton Co. 100. 1966.

VERBENA DELTICOLA Small

Additional bibliography: Moldenke, Phytologia 13: 186 & 191—192. 1966; Moldenke, Résumé Suppl. 13: 2. 1966

VERBENA DEMISSA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 455. 1965.

Recent collectors have found this plant on sparsely brushy hillsides, at 3300 meters altitude, in flower and fruit in July.

Additional citations: ECUADOR: Cañar: Játiva & Epling 260 (La—53980).

VERBENA DISSECTA Willd.

Additional bibliography: Moldenke, Phytologia 13: 192--194, 213, 214, & 217. 1966; Moldenke, Résumé Suppl. 13: 3. 1966.

The Bailetti 231 [Herb. Inst. Miguel Lillo 31690] cited by me previously as this species seems, rather, to be V. selloi Spreng. Its leaves do resemble those of typical V. dissecta, but its calyx

and bractlets more closely resemble those of V. selloi. Possibly it may be a hybrid between the two species.

VERBENA DISSECTA f. ALBA Moldenke
Additional bibliography: Moldenke, Phytologia 13: 194. 1966; Moldenke, Résumé Suppl. 13: 3. 1966.

VERBENA ELEGANS H.B.K.
Additional bibliography: Moldenke, Phytologia 13: 194--195. 1966; Moldenke, Résumé Suppl. 13: 2. 1966.

VERBENA ELEGANS var. ASPERATA Perry
Additional bibliography: Moldenke, Phytologia 13: 195. 1966; Moldenke, Résumé Suppl. 13: 2. 1966.

xVERBENA ENGELMANNII Moldenke
Additional bibliography: N. L. Britton, N. J. Geol. Surv. Final Rep. State Geol. 2 (1): 194. 1889; Moldenke, Phytologia 13: 195. 1966; Gaiser, Surv. Vasc. Pl. Lambton Co. 100. 1966.
This hybrid is recorded by Britton (1889) from "Near Riegelsville" in Warren County, New Jersey. Gaiser (1966) says "only on Walpole Is., in two locations.....Both parental species are abundant on the island", Lambton County, Ontario.

VERBENA GOODDINGII Briq.
Additional bibliography: Moldenke, Phytologia 13: 196--197. 1966; Moldenke, Résumé Suppl. 13: 2. 1966.
The flowers on Crutchfield 243 are described as "light-blue" and the plant was found growing on a dry rocky hillside.
Additional citations: ARIZONA: Mohave Co.: J. R. Crutchfield 243 (Ld).

VERBENA GOODDINGII var. NEPETIFOLIA Tidestr.
Additional bibliography: Moldenke, Phytologia 13: 196--197. 1966; Moldenke, Résumé Suppl. 13: 2. 1966.

VERBENA HALEI Small
Additional bibliography: Moldenke, Phytologia 13: 197--199 & 217. 1966.
Recent collectors report this plant growing in sandy silt, sandy loam silt, black clay, fine sandy silt of the Claiborne Group, and in open fields. Material has been misidentified and distributed in herbaria under the name "V. placata Greene." On the other hand, the R. Bruno 41 and Sosa 32, distributed as V. halei, are actually V. cloverae Moldenke. Malacara P. & Gutierrez F. 21 is a mixture with V. plicata Greene.
Additional citations: MISSOURI: Saint Louis: Muhlenbachs 1256 (Ac), 1423 (Ac), 1607 (Ac). TEXAS: Bee Co.: Rios & Cavazos 205 (Ld). Bexar Co.: Chavez, Flores, & Hein 96 (Ld). Dimmit Co.: Fowler & Vergara 112 (Ld). Duval Co.: Ramirez, Lopez, & McCart 8787 (Ld). Goliad Co.: Rios & Cavazos 181 (Ld). Jim Hogg Co.:

Malacara P. & Gutierrez F. 21, in part (Ld). Jim Wells Co.: P. Cabrera 101 (Ld). Live Oak Co.: Rios & Cavazos 221 (Ld). Rains Co.: B. J. Simpson 25 (Ld). San Patricio Co.: F. Guajardo 83 (Ld); E. F. Gutierrez 70 (Ld). Starr Co.: M. de J. Solis 149 (Ld). Victoria Co.: Rios & Cavazos 165 (Ld). Webb Co.: Cisneros 24 (Ld); J. Gonzalez 41 (Ld); J. M. Hughes 44 (Ld); S. Webber 12 (Ld). Zapata Co.: F. Guajardo 39 (Ld). Zavala Co.: Moore, Carrasco, Gongora, & McCart 8997 (Ld).

VERBENA HASTATA L.

Additional bibliography: N. L. Britton, N. J. Geol. Surv. Final Rep. State Geol. 2 (1): 194. 1889; Mrs. W. S. Dana, How to Know Wild Fls., rev. ed., 314--316, 365, & 371, pl. 135. 1896; Stack, Wild Fls. 349--351, 400, & 411. 1909; W. J. Beal, Mich. Agr. Coll. Exp. Sta. Bull. 260: 153, fig. 153 (1910) and 267, ed. 2, 115, fig. 174. 1915; Sievers, U. S. Dept. Agr. Misc. Publ. 77: 15, fig. 24. 1930; Quick, Wild Fls. North. States 371--372, 375, & 518, fig. 190. 1939; Muenscher, Cornell Agr. Exp. Sta. Bull. 635 [Weeds N. Y.], pr. 2, 10 & 387. 1939; Oswald, Wild Flow. Dossier 1: 20, fig. 3. 1951; Hocking, Excerpt. Bot. A8: 226 (1965) and A9: 367. 1965; F. H. Montgomery, Native Wild Pl., pr. 2, 121, fig. 209. 1965; Cody, Ind. Sem. Bot. Gard. Ottawa 1966: 19. 1966; Moldenke, Phytologia 13: 199--200. 1966; Gaiser, Surv. Vasc. Pl. Lambton Co. 100. 1966.

Additional illustrations: Mrs. W. S. Dana, How to Know Wild Fls., rev. ed., 315, pl. 135. 1896; W. J. Beal, Mich. Agr. Coll. Exp. Sta. Bull. 260: fig. 153 (1910) and 267, ed. 2, fig. 174. 1915; Sievers, U. S. Dept. Agr. Misc. Publ. 77: fig. 24. 1930; Quick, Wild Fls. North. States 375, fig. 190. 1939; Oswald, Wild Flow. Dossier 1: 20, fig. 3. 1951; F. H. Montgomery, Native Wild Pl., pr. 2, fig. 209. 1965.

VERBENA HATSCHBACHI Moldenke

Additional bibliography: Moldenke, Phytologia 9: 284--285. 1963; Hocking, Excerpt. Bot. A8: 226. 1965.

VERBENA HAYEKII Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A8: 226. 1965; Moldenke, Phytologia 13: 200. 1966.

VERBENA HERTERI Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A8: 226. 1965; Moldenke, Phytologia 13: 200. 1966; Moldenke, Résumé Suppl. 13: 3. 1966.

VERBENA HIRTA Spreng.

Additional bibliography: Hocking, Excerpt. Bot. A8: 226. 1965; Moldenke, Phytologia 13: 200--201. 1966.

Smith and his associates found this plant growing in thickets, bogs, low woods, forests, gallery forests, dry fields, and dry open ground, on cliffs, along boggy brooks, and ruderal. Smith &

Klein 14936 represents the very hairy form of the species. The Tryons found the species in shrubby grassland and sedgeland with local elfin-woods dominated by granitic rocks. Tryon & Tryon 6713 had "blue-purple" flowers and was "woody at base".

Additional citations: BRAZIL: Rio de Janeiro: Angeli 107 [Herb. Cent. Pesq. Florest. 345] (Ac); Tryon & Tryon 6713 (Ac). Santa Catarina: A. Castellanos 24675 [Herb. Cent. Pesq. Florest. 3417] (Ac).

VERBENA HIRTA var. GRACILIS Dusén

Additional bibliography: Hocking, Excerpt. Bot. A8: 226. 1965; Moldenke, Phytologia 13: 201. 1966.

VERBENA HISPIDA Ruíz & Pav.

Additional bibliography: Hocking, Excerpt. Bot. A8: 226. 1965; Moldenke, Phytologia 13: 201. 1966.

VERBENA HOOKERIANA (Covas & Schnack) Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A8: 226. 1965; Moldenke, Phytologia 13: 201. 1966.

VERBENA HUMIFUSA Cham.

Additional bibliography: Hocking, Excerpt. Bot. A8: 226. 1965; Moldenke, Phytologia 13: 201—202. 1966.

xVERBENA HYBRIDA Voss

Additional bibliography: McCurdy, Book Gard. Fls. 72—73, 300, & 311. 1931; Hocking, Excerpt. Bot. A8: 226. 1965; Moldenke, Phytologia 13: 202—203. 1966; Moldenke, Résumé Suppl. 13: 7. 1966.

xVERBENA ILLICITA Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A8: 227. 1965; Moldenke, Phytologia 13: 203. 1966.

VERBENA INCISA Hook.

Additional bibliography: Angely, Bibl. Veg. Paran. 136. 1964; Hocking, Excerpt. Bot. A8: 227. 1965; Moldenke, Phytologia 13: 203. 1966.

xVERBENA INTERCEDENS Briq.

Additional bibliography: Hocking, Excerpt. Bot. A8: 227. 1965; Moldenke, Phytologia 13: 203—204. 1966.

VERBENA INTERMEDIA Gill. & Hook.

Additional bibliography: Hocking, Excerpt. Bot. A8: 227. 1965; Moldenke, Phytologia 13: 204. 1966; Moldenke, Résumé Suppl. 13: 3. 1966.

VERBENA LACINIATA (L.) Briq.

Additional bibliography: Hocking, Excerpt. Bot. A8: 227. 1965; Moldenke, Phytologia 13: 204 & 213. 1966.

The Bailetti 231 [Herb. Inst. Miguel Lillo 31690], distributed as V. erinoides Lam. and cited by me previously as V. dissecta Willd., is probably V. selloi Spreng.

VERBENA LANDBECKI R. A. Phil.

Additional bibliography: Moldenke, Phytologia 11: 469. 1965.

Additional citations: CHILE: Aconcagua: Landbeck s.n. [Choapa; Macbride photos 17425; Herb. Mus. Nac. Hist. Nat. Chile 54672] (W--photo of isotype). Coquimbo: Marticorena & Matthei 409 (Z).

VERBENA LASIOSTACHYS Link

Additional bibliography: Hocking, Excerpt. Bot. A8: 227 (1965) and A9: 364. 1965; Moldenke, Phytologia 13: 204. 1966.

VERBENA LASIOSTACHYS f. ALBIFLORA Moldenke

Additional bibliography: Moldenke, Phytologia 9: 465--466. 1964; Hocking, Excerpt. Bot. A9: 364. 1965.

VERBENA LIPOZYGIOIDES Walp.

Additional bibliography: Hocking, Excerpt. Bot. A9: 364 & 365. 1965; Moldenke, Phytologia 13: 205. 1966.

In the 1965 reference given above this species is referred to as "L. lipozygioides Walp." through a typographic error.

VERBENA LITORALIS H.B.K.

Additional bibliography: Hocking, Excerpt. Bot. A9: 365. 1965; Moldenke, Phytologia 13: 205--206. 1966; Moldenke, Résumé Suppl. 13: 3. 1966.

Játiva & Epling found this plant growing in secondary forests. Material has been misidentified and distributed in herbaria as V. carolina L. and even as Salvia nigriflora Epl. in the Lamiaceae.

Turczaninow (1863) has this to say about his Verbena nudiflora: "V. caule erecto tetragono, inferne folioso, superne paucifolio vel omnino foliis denudato, di- vel trichotomo, divisionibus simplicibus monostachyis, vel iterum divisis 2--3 stachyis, spicis filiformibus; foliis anguste-lanceolatis, basi longe attenuata sessilibus, acutiusculis, a medio ad apicem argute et saepe inaequaliter serratis, supra punctis bullatis, interdum breviter piliferis exasperatis, subtus ad nervationes strigillosis; bracteis lanceolato-subulatis calycem aequantibus; nuculis striatis laevibus. In insula Sandwicensi Wahoo lecta. Species V. angustifoliae simillima, sed praeter folia bullata recedit floribus fructibusque duplo minoribus, praeterea nuculas in V. angustifolia semper transverse rugosas vidi. Ad hanc speciem proximae et nonnisi diversae panicula saepe ramosissima pedali et bipedali e spicis numerosis constante, ad ramificationes tantum foliis diminutis integerrimis instructa: specimen a Galipan, prov. Caracasanae Funk No. 325, e Cumana prope Cumanacoa Funk No. 54 et Galeotti No. 359. Nuculae ejusdem magnitudinis, apice parum rugulosae, folia latiora et angustiora. Haec forte ad V. longifoliam Mart. et Gal. spectant.... Sed specimina Funkiana e Caripe sub No. 637 et Lindenianum e vic-

iniis Meridae panicula multo minus ramosa et oligostachya gaudentia, fere medium tenent inter hanc et V. nudifloram. An omnes ad speciem unicam reducendae. Planta in schedula dicitur annua. Stirps Novo-Grenadensis e prov. Ocana, Schlim. No. 564 speciem valde propinquam indicat at caule e schedula fruticoso et foliis parvis, in pagina superiore integerrimis paucidentatisve recedente." He places the species in the Section Leptostachyae.

Additional citations: COLOMBIA: Valle del Cauca: López Figueiras 8219 (W—2451148), 8478 (W—2451145). ECUADOR: Los Ríos: Játiva & Epling 55 (La—49643).

VERBENA LOBATA Vell.

Additional bibliography: Hocking, Excerpt. Bot. A9: 365. 1965; Moldenke, Phytologia 13: 206—207. 1966.

Additional citations: BRAZIL: Rio de Janeiro: Herb. Inst. Oswaldo Cruz 651 (W—2454227).

VERBENA LONGIFOLIA Mart. & Gal.

Additional bibliography: Hocking, Excerpt. Bot. A9: 365. 1965; Moldenke, Phytologia 13: 207. 1966; Moldenke, Résumé Suppl. 13: 2. 1966.

VERBENA MENDOCINA R. A. Phil.

Additional bibliography: Hocking, Excerpt. Bot. A9: 365. 1965; Moldenke, Phytologia 13: 209. 1966.

The collection cited below was previously cited by me as V. tenera Spreng. in error.

Additional citations: URUGUAY: A. Castellanos s.n. [23. I. 1947; Herb. Inst. Miguel Lillo 15126] (N).

VERBENA MENTHAEFOLIA Benth.

Additional bibliography: Hocking, Excerpt. Bot. A9: 365. 1965; Moldenke, Phytologia 13: 209. 1966.

VERBENA MICROPHYLLA H.B.K.

Additional bibliography: Hocking, Excerpt. Bot. A9: 365. 1965; Moldenke, Phytologia 13: 209. 1966.

The Jörgensen 1737 cited by me as V. microphylla in 1948 and as V. tenera in 1964 is actually V. parodii (Covas & Schnack) Moldenke.

VERBENA MINUTIFLORA Briq.

Additional bibliography: Angely, Bibl. Veg. Paran. 196. 1964; Moldenke, Phytologia 13: 210. 1966.

VERBENA MONTEVIDENSIS Spreng.

Additional bibliography: Hocking, Excerpt. Bot. A9: 365. 1965; Moldenke, Phytologia 13: 210—211. 1966.

Additional citations: BRAZIL: Santa Catarina: A. Castellanos 24880 [Herb. Cent. Pesq. Florest. 3546] (Ac).

VERBENA MULTIGLANDULOSA Moldenke

Additional bibliography: Moldenke, Phytologia 13: 211. 1966; Moldenke, Résumé Suppl. 13: 3. 1966.

VERBENA OFFICINALIS L.

Additional and emended bibliography: A. Gray in M. C. Perry, Narr. Exped. China Seas & Japan 2: 316. 1856; Boiss., Fl. Orient. 4: 534. 1879; Aitch., Journ. Linn. Soc. Lond. Bot. 18: 85. 1880; N. L. Britton, N. J. Geol. Surv. Final Rep. State Geol. 2 (1): 194. 1889; J. Matsumura, Ind. Pl. Jap. 2 (2): 534. 1912; Gorsch., Fl. URSS 19: 694. 1953; Kitamura, Fl. Afghan. 327. 1960; Hocking, Excerpt. Bot. A9: 365. 1965; Moldenke, Phytologia 13: 212--213. 1966.

Additional citations: GERMANY: Degener & Degener 29214 (Ac). CRETE: Degener & Degener 29389 (Ac). FORMOSA: Degener & Degener 28983 (Ac).

VERBENA PARODII (Covas & Schnack) Moldenke

Additional bibliography: Moldenke, Phytologia 13: 213--214. 1966.

The Jörgensen 1737, cited below, was erroneously cited by me as V. microphylla H.B.K. in my Alph. List Cit. 2: 599 (1948) and as V. tenera Spreng. in Phytologia 10: 148 (1964) and 11: 275 (1965), while Venturi 5267 was incorrectly cited as V. tenera var. albiflora Kuntze in Phytologia 11: 276 (1965).

The flowers are described as "white" on Venturi 5267 and as "rose-blue" on Jörgensen 1737. Venturi found the species in flower in September at 700 meters altitude.

Additional citations: ARGENTINA: Catamarca: Jörgensen 1737 [Herb. Inst. Miguel Lillo 31472; Herb. Osten 11009] (N, Ug, W--874768). Jujuy: Venturi 5267 (Gg--158515, W--1591467).

VERBENA PERENNIS Wooton

Additonal bibliography: Moldenke, Phytologia 13: 214. 1966.

The flowers on Correll & Correll 30882 are described as "purple" and the plant was found growing in rocky soil on small mountains.

Additional citations: TEXAS: Pecos Co.: Correll & Correll 30882 (Ld).

xVERBENA PERRIANA Moldenke

Additional bibliography: Moldenke, Phytologia 13: 214--215. 1966; Gaiser, Surv. Vasc. Pl. Lambton Co. 101. 1966.

VERBENA PHLOGIFLORA Cham.

Additional bibliography: J. Matsumura, Ind. Pl. Jap. 2 (2): 534. 1912; Moldenke, Phytologia 13: 216. 1966.

The record of this species being cultivated in Japan as given by Matsumura (1912) probably refers to xV. hybrida Voss.

Additional citations: BRAZIL: State undetermined: Sellow s.n. [Macbride photos 34351] (W--photo of type).

VERBENA PLATENSIS Spreng.

Additional bibliography: Hocking, Excerpt. Bot. A9: 366. 1965; Moldenke, Phytologia 13: 216--217. 1966.

VERBENA PLICATA Greene

Additional synonymy: Verbena placata Greene, in herb.

Additional bibliography: Hocking, Excerpt. Bot. A9: 366. 1965; Moldenke, Phytologia 13: 217. 1966.

Recent collectors have found this plant growing in loose sand, gravel, sandy silt, caliche, and in a mixture of gravel and sandy silt. Material has been distributed in herbaria (probably through a transposition of labels) as Larrea tridentata Coville in the Zygophyllaceae. On the other hand, the Rios & Cavazos 205 & 221, distributed as V. plicata, are V. halei Small. Malacara P. & Gutierres F. 21 and Rios & Cavazos 233 are mixtures with V. halei.

Additional citations: TEXAS: Duval Co.: N. Castillo 6 (Ld); Malacara P. & Gutierrez F. 35 (Ld). Hidalgo Co.: R. A. Leal 30 (Ld). Jim Hogg Co.: Malacara P. & Gutierrez F. 21, in part (Ld); Rios & Cavazos 102 (Ld). Jim Wells Co.: N. Castillo 27 (Ld, Ld). La Salle Co.: Gonzalez & Quesada 14 (Ld). McMullen Co.: Rios & Cavazos 233, in part (Ld). Starr Co.: Rios & Cavazos 52 (Ld). Webb Co.: J. Gonzalez 26 (Ld); Guerra, Garcia, & Garcia 23 (Ld); Rios & Cavazos 33 (Ld); S. Webber 20 (Ld). Zapata Co.: M. de J. Solis 106 (Ld). MEXICO: Tamaulipas: F. A. Barkley 14324 (Ld).

VERBENA PORRIGENS R. A. Phil.

Additional bibliography: Moldenke, Phytologia 11: 477. 1965.

Additional citations: CHILE: Aconcagua: Landbeck s.n. [near Quilimar, Dec. 1861; Herb. Mus. Nac. Hist. Nat. Chile 54729; Macbride photos 17441] (W--photo of isotype).

VERBENA PULCHELLA Sweet

Additional synonymy: Glandularia pulchella (Sweet) Troncoso, Darwiniana 13: 473. 1964. Glandularia pulchella var. pulchella Troncoso, Darwiniana 13: 475 & 476. 1964.

Additional bibliography: Troncoso, Darwiniana 13: 468--470 & 473--476, fig. 2. 1964; Moldenke, Phytologia 11: 477 (1965) and 13: 192. 1966; Shinners, Sida 2: 266. 1966.

Additional illustrations: Troncoso, Darwiniana 13: 474, fig. 2. 1964.

Troncoso (1964) describes this species as follows: "Planta perenne, sufruticosa en la base, de tallos generalmente muy extendidos, postrados y apoyantes, radicantes sólo en la base luego ascendentes. Ramas subtetrágonas estrigoso-pubescentes a veces hirsútulas, entrenudos largos, de 2--6 cm long. Hojas pinnatisectas, con fascículos de hojitas menores en las axilas, atenuadas en breve pecíolo, lámina de ámbito oval-triangular, lacinias linear-lanceoladas, subagudas, estrigosas en ambas caras, en la inferior sobre el borde y el nervio medio prominante, epifilo surcado, hipofilo comúnmente con puntos pelúcidos (sub lente),

margen revoluto (principalmente en material de herbario). Inflorescencia solitaria en ramitas terminales erguidas, en densas cabezuelas capituliformes en la floración que se alargan después de la antesis en delgadas espigas de 5--6 cm long. Brácteas oval-lanceoladas, de 3,5--4 long., subcóncavas en la base, rala o densamente estrigosas, hirsútulas en el borde y porción basal. Cáliz tubuloso, de 8--9 mm long. (incluídos los dientes), estrigoso o cano-estrigoso en toda su superficie, dientes oval-subulados, desiguales, los mayores de 0,8--1 mm long., rectos o subrectos. Brácteas, cáliz y nervios en el envés de la hojas con pequeñísimas glándulas pateliformes, subsesiles. Corola glabra exteriormente, tubo superando 1/3 el cáliz. Estambres típicos, los dos superiores con apéndices anterales cilíndricos, delgados, que superan las tecas asomándose en la garganta corolar. Pistilo típico, estilo filiforme de 7,5--8 mm long. Mericarpios cilíndricos de 3,5--4 mm long., ápice subrostrado, superficie dorsal pardo-negruzca, reticulado-estriada, la ventral, blanco verrucosa (ver figura), pericarpio prolongado y ensanchado en la base, ésta huera."

She notes "Habita en campos altos y arenosos del S de Brasil, Uruguay, centro y litoral argentino. Es usa especie muy variable!" She cites from Buenos Aires Burkart 23908 (Si) and 8490 (Si) and cultivated in Buenos Aires Herb. Bentham s.n. [Soc. Hort. London, 20-VII-1829] (K), and from Uruguay Felippone 3147 (Si).

She separates two varieties as follows:

1. Plants ascending or prostrate, rooting only at the base.
   2. Bractlets lanceolate-subulate, strigose-hirsutulous; calyx-teeth subulate; anther-appendages cylindric, slightly exserted from the corolla-throat.....V. pulchella.
   2a. Bractlets oval, "pestañosas", subglabrous; calyx-teeth acute, apiculate, short; anther-appendages club-shaped, plainly exserted from the corolla-throat.....V. pulchella var. clavellata.
1a. Plants creeping, in general low, much shorter and more slender.....V. pulchella var. gracilior.

However, after examining an isotype of her var. gracilior, I find this to be typical V. selloi Spreng. Herter 1805 [Herb. Herter 96556] was cited by me in a previous work as V. dissecta f. alba Moldenke, but seems definitely to represent V. pulchella instead. The H. M. Smith 5, cited below, was erroneously cited by me as V. tenera Spreng. in Phytologia 11: 275 (1965) and was originally distributed as V. tenuisecta Briq. Troncoso (1964) cites Rodrigo 2339 as V. dissecta, but the New York Botanical Garden specimen of this collection, at least, is definitely V. pulchella. Rosengurtt B.992, which I previously cited a V. pulchella, proves to be the type collection of V. subincana (Troncoso) Shinners.

Rambo 48914 is described by the collector as prostrate, with violet flowers, growing in sandy places. Herter encountered the species at 2 meters altitude. The Boffa 330, T. Meyer 12290, and

Rambo 48914, cited below, were previously erroneously cited by me as V. dissecta Willd. On the other hand, the Frenguelli 105 & 137, previously cited by me as V. pulchella, appear to be V. dissecta instead. Similarly, Herb. Herter 83911, Herter 181g, and J. T. Lima s.n. [II.1946; Herb. Rio Jan. 55466], previously cited by me as V. pulchella, are V. subincana, but Herb. Herter 50882, originally distributed by the collector as V. pulchella and cited by me previously as V. dissecta, is actually V. selloi Spreng.

The very old Commerson and Saint-Hilaire collections cited under V. dissecta and V. selloi have the name V. pulchella given as a synonym of V. tenera on their labels in a very old handwriting, but I do not think that this reduction is valid.

Additional citations: BRAZIL: Rio Grande do Sul: Rambo 48914 (N). URUGUAY: Herter 1805 [Herb. Herter 96556] (N, Z); H. M. Smith 5 (W—1193661). ARGENTINA: Buenos Aires: Boffa 330 (N). Salta: T. Meyer 12290 (N).

VERBENA PULCHELLA f. LATILOBATA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 26. 1964; Troncoso, Darwiniana 13: 468, 470, & 484—485. 1964; Moldenke, Phytologia 13: 192. 1966.

Troncoso (1964) reduces this taxon to synonymy under V. dissecta Willd., but I do not agree. Its characters are much closer to those of V. pulchella if I am interpreting this species and V. dissecta correctly.

VERBENA PULCHRA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 478. 1965; Rambo, Pesquis. Bot. 21: 51 & [60]. 1965.

Rambo (1965) cites Herb. Anchieta 29682 [Henz s.n.] from Rio Grande do Sul. He describes the plant as "Very vigorous, erect, apparently more than 1 m high", growing in "Wet, densely and highly vegetated Campos". He notes "Only one findplace in the northeastern Lowlands" of Rio Grande do Sul, and gives the general distribution of the species as "S. Paulo to Misiones and Uruguay".

VERBENA PUMILA Rydb.

Additional bibliography: Moldenke, Biol. Abstr. 45: 2772. 1964; Moldenke, Résumé Suppl. 12: 1. 1965; Hocking, Excerpt. Bot. A9: 366. 1965; Moldenke, Phytologia 11: 478, 490, & 491 (1965) and 13: 186. 1966; Moldenke, Résumé Suppl. 13: 2. 1966.

Bruni & Pena found this plant growing in rocky loam in Nuevo León; others have found it in red loamy soil, red sandy loam, or red soil, and among road and gravel in xerophytic canyons, as well as in fairly sandy soil along roadsides. Parks, Warnock, & Turner refer to it as a "low infrequent annual" with "whitish flowers" (their collection may, therefore, represent f. albida Moldenke; the base of the cocci in this collection is wide-flaring, a puzzling character occasionally seen in speci-

mens tentatively regarded and cited as V. pumila). The J. A. de la Cruz s.n. [12.IV.1961], distributed as V. pumila, is actually V. cameronensis L. I. Davis.

Additional citations: TEXAS: Burnet Co.: C. L. Lundell 15050 (Ld); McCart 6079 (Ld). Frio Co.: Lucas, Painter, & Barkley 14213 (Ld); Painter, Lucas, & Barkley 14201 (Ld). La Salle Co.: A. Cantu 71 (Au—222196). Llano Co.: Rose-Innes & Warnock 793 (Ld). Medina Co.: Barrera & Laurel 111 (Ld). Val Verde Co.: Parks, Warnock, & Turner 236 (Mi). MEXICO: Nuevo León: F. A. Barkley 14281 (Ld); Bruni & Pena 38 (Au—232622, Ld); Oatman & Rowlett s.n. [3 Feb. 1964] (Au—227525). San Luis Potosí: J. Rzedowski 7536 (Ip).

VERBENA PUMILA f. ALBIDA Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 45: 2772. 1964; Moldenke, Phytologia 11: 478. 1965.

Possibly Parks, Warnock, & Turner 236, from Val Verde County, Texas, and described as having "whitish flowers", may belong here. Its cocci are wide-flaring at the base, and it is cited herein tentatively as V. pumila Rydb.

VERBENA QUADRANGULATA Heller

Additional bibliography: Moldenke, Phytologia 11: 478. 1965.

This species has been collected in fruit also in February. Recent collectors have found it in sandy or light tan sandy loam, gravel or Pleistocene gravel, light tan clay, fine sandy silt or grayish calcareous silt, light grayish-tan sandy loam, light-tan or loose light-tan sand, pale-tan loose sand, very loose light-tan sand, sandy silt, red or deep orange sand, and in hard-packed soil, on riverbottoms, in openchaparral pastures, and at the water's edge. The Flores call it "abundant in caliche", while Gamez describes it as "common in fine sandy silt". The I. Moran 10, distributed as V. quadrangulata, is actually V. ciliata var. pubera (Greene) Perry, while Barrera & Laurel 111 is V. pumila Rydb.

Additional citations: TEXAS: Duval Co.: P. Cabrera 53 (Au—232964, Ld); N. Castillo s.n. [10 March 1963] (Au—232963); Ramirez, Lopez, & McCart 8768 (Au—232663); Ramos, Sandoval, & McCart 8007 (Au—222245). Hidalgo Co.: R. L. Crockett 8013 (Ld). Jim Hogg Co.: Alvarez, Guajardo, Salazar, & McCart 7784 (Au—222246); Sanchez, Rodriguez, & McCart 8311 (Au—222217, Ip). Kleberg Co.: Villarreal & Earles 102 (Au—232962, Ld). La Salle Co.: Botello 49 (Au—222218). McMullen Co.: Alvarez, Guajardo, Salazar, & McCart 7723 (Au—222225). Starr Co.: Alvarez, Guajardo, Salazar, & McCart 7924 (Au—222220), 8042 (Au—222216); M. de la L. Campos 79 (Ld); Ramos, Sandoval, Salazar, & McCart 7879 (Au—222221, Ip). Webb Co.: Alvarez, Guajardo, Salazar, & McCart 7632 (Au—222249); D. Cardenas 57 (Ld); Flores & Flores 118 (Au—

232961); Gamboa & Dohnke 105 (Au—233069); Gamez 80 (Au—232958); E. G. Garcia 145 (Au—232960); J. Gonzalez 38 (Ld); Guerra, Garcia, & Garcia 3 (Ld); M. de J. Solis 145 (Au—232679); S. Webber 14 (Ld). Zapata Co.: Herrera & McCart 7699 (Au—222222); Ramos, Sandoval, Salazar, & McCart 7848 (Au—222214, Au—222219). MEXICO: Tamaulipas: Dominguez & McCart 8182 (Au—232959); Escalante 36 (Ip).

VERBENA RACEMOSA Eggert

Additional bibliography: Hocking, Excerpt. Bot. A5: 44. 1962; Moldenke, Phytologia 11: 478, 490, & 497. 1965.

Additional citations: TEXAS: Brewster Co.: B. H. Warnock 418 (Ld), 20105 (Ld).

VERBENA RADICATA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 478. 1965; Moldenke, Résumé Suppl. 12: 13. 1965.

VERBENA RADICATA var. GLABRA (Hicken) Moldenke

Additional bibliography: Moldenke, Phytologia 11: 478. 1965; Moldenke, Résumé Suppl. 12: 13. 1965.

VERBENA RAMBOI Moldenke

Additional bibliography: Moldenke, Phytologia 11: 52—53. 1964; Rambo, Pesquis. Bot. 21: 51 & [60]. 1965.

Rambo (1965) cites Herb. Anchieta 25786 and 25787 from Rio Grande do Sul, both collected by himself. He suggests that the taxon may be conspecific with V. stellarioides Cham., and describes it as "Erect, stiff, coarse, about 30 cm high", growing in "Slightly shrubby Campos" on the "Southwestern plains only" in Rio Grande do Sul. He gives its general distribution as "So far, RGS [Rio Grande do Sul] only."

VERBENA RECTA H.B.K.

Additional bibliography: Moldenke, Phytologia 11: 478. 1965.

Recent collectors have found this plant growing in Abies forests, Abies religiosa woods, and Pinus hartwegii woods, at altitudes of 3000 to 3200 meters, flowering in July. The Paray 2449, distributed as V. recta, is actually V. carolina L.

Additional citations: MEXICO: Federal District: Paray 564 (Ip), Hidalgo: Galván s.n. [4.VIII.1963] (Ip). México: J. Rzedowski 18409 (Ip), s.n. [4.VIII.1962] (Ip).

VERBENA REITZII Moldenke

Additional bibliography: Moldenke, Phytologia 11: 58—59. 1964; Rambo, Pesquis. Bot. 21: 51 & [60]. 1965.

Rambo (1965) cites Herb. Anchieta 50761 [Reitz 3663] and 50794 [Reitz 3726] from Santa Catarina. He describes the plant as a "Suffruticose perennial, erect, apparently about 1 m high", growing in "Wet, apparently densely vegetated Campos" and notes

"To be found along the northeastern frontier" of Rio Grande do Sul, but notes that its general distribution is "So far, SC [Santa Catarina] only".

VERBENA REITZII var. CASTRENSIS Moldenke, var. nov.

Haec varietas a forma typica speciei recedit ramis ramulisque foliisque antrorse strigosis, foliis 1--1.5 cm. longis ad basin acutis sessilibus, inflorescentiis spicatis usque ad 2.8 cm. elongatis.

This variety differs from the typical form of the species in having the stems, branches, branchlets, leaves, and peduncles appressed-strigose with antrorse hairs, the leaves only 1--1.5 cm. long and acute at the sessile (not amplexicaul) base, and the inflorescences becoming to 2.8 cm. long during and after anthesis.

The type of the variety was collected by Lyman Bradford Smith, Roberto M. Klein, and Gerdt Günther Hatschbach (no. 14526) in rocky campos, sandstone ledge, stream margin, bog, forest, and fallow field, at Carambei by the Rio São João, ca. 24°30' S., 50° 02' W., at an altitude of 950 meters, municipality of Castro, Paraná, Brazil, on January 15, 1965, and is deposited in the H. N. Moldenke herbarium at Plainfield, New Jersey.

Citations: BRAZIL: Paraná: Smith, Klein, & Hatschbach 14526 (Z--type).

VERBENA RIBIFOLIA Walp.

Additional bibliography: Moldenke, Phytologia 11: 59--62. 1964.

Additional citations: CHILE: Concepción: Besser 12 [Macbride photos 17443] (W--photo of type).

VERBENA RIBIFOLIA f. ALBA Acevedo de Vargas

Additional bibliography: Moldenke, Phytologia 11: 60. 1964.

Ricardi found this plant growing at 1800 meters altitude.

Additional citations: CHILE: Colchagua: Ricardi 3175 (Z).

VERBENA RIGIDA Spreng.

Additional bibliography: Moldenke, Biol. Abstr. 33: 1215. 1959; Hocking, Excerpt. Bot. A5: 44. 1962; Angely, Bibl. Veg. Paran. 196. 1964; Hocking, Excerpt. Bot. A9: 366. 1965; Moldenke, Phytologia 11: 478--479. 1965; Moldenke, Biol. Abstr. 46: 3618. 1965; Moldenke, Résumé Suppl. 12: 5. 1965; Neal, In Gard. Hawaii, new rev. ed., 722. 1965; Rambo, Pesquis. Bot. 21: 52--53 & [60]. 1965.

Sidey 3509 is said to have had "mauve" flowers and was found growing in grasslands. Smith & Klein found the species in forests, on dry campos, and ruderal in Santa Catarina.

Rambo (1965) cites Herb. Anchieta 439, 1122, 3904, 8376 [Emrich s.n.], 8844, 9146, 9191, 9219, 9336, 9550, 9798, 9990, 10064, 11253 [Heidler s.n.], 11257 [Friderichs s.n.], 25940 [Friderichs s.n.], 27143, 27286, 28229, 29121, 34727, 37551, 43694, 44028, 44150, 44164, 48078 [Sehnem 3505], 51646, 53021, 53289, 56045,

57248, 58857 [Camargo 173], 62057 [Camargo 1944], 63055 [Schlichting s.n.], 63278 [Sacco 853], 63786 [Sacco s.n.], and 63861 [Sacco 82] from Rio Grande do Sul, 47913 [Sehnem 3036] from Santa Catarina, and 4052 and 4080 from Uruguay, all collected by himself except where otherwise indicated. He describes the species as "Erect, stiff, coarse, up to 40 cm high", growing in "Dry, more or less shrubby Campos, shows weedy tendencies.....Over the whole of the Campos area" in Rio Grande do Sul, with a general distribution "From southern USA to Uruguay, northern Argentina and Chile."

Additional citations: ALABAMA: Crenshaw Co.: C. T. Reed 2087 (Ld). BRAZIL: Minas Gerais: N. Santos 5924 (Ac). Santa Catarina: A. Castellanos 24689 [Herb. Cent. Pesq. Florest. 3317] (Pf); Smith & Klein 13813 (W--2451612). ARGENTINA: Buenos Aires: Gillies s.n. [Macbride photos 34349] (W--photo). SOUTH AFRICA: Transvaal: Sidey 3509 (W--2377223).

VERBENA RIGIDA f. GLANDULIFERA Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 33: 1215. 1959; Hocking, Excerpt. Bot. A5: 44. 1962; Moldenke, Phytologia 11: 95—96. 1964; Angely, Bibl. Veg. Paran. 196. 1964.

VERBENA RIGIDA var. OBOVATA (Hayek) Moldenke

Additional bibliography: Moldenke, Phytologia 11: 479. 1965; Moldenke, Résumé Suppl. 12: 5. 1965.

Additional citations: BRAZIL: Paraná: Dombrowski & Saito 1308/1124 (Ac). PARAGUAY: Pedersen 5205 (W—2432935).

VERBENA RINCONENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 11: 479. 1965.

Dodds & Simpson found this plant flowering in January.

Additional citations: MEXICO: México: Dodds & Simpson 9 (Mi).

VERBENA RUNYONI Moldenke

Additional bibliography: Moldenke, Phytologia 11: 109—112 (1964) and 11: 460 & 502. 1965; Moldenke, Résumé Suppl. 12: 1. 1965.

Additional citations: TEXAS: Cameron Co.: Fleetwood 8001 (Au—230978). Hidalgo Co.: R. L. Crockett 8032 (Ld).

xVERBENA RYDBERGII Moldenke

Additional bibliography: Moldenke, Phytologia 11: 462 & 479. 1965; Moldenke, Résumé Suppl. 13: 1. 1966; Gaiser, Surv. Vasc. Pl. Lambton Co. 100. 1966.

One each of the A. R. Moldenke 819 and 942 specimens cited previously as being deposited in my own herbarium is now in the Aarhus University herbarium. Heidenreich found this hybrid growing in an open field in Ontario. Gaiser (1966) says "only at Point Edward, V. hastata was on lower land under the Ambassador Bridge, V. stricta, on sandy banks of St. Clair R.; numerous hybrids were along the roadway between the parents and intermingled

with V. stricta."

Additional citations: ONTARIO: Peterborough Co.: Heidenreich 292 [7138] (Mi).

VERBENA SANTIAGUENSIS (Covas & Schnack) Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A6: 535. 1963; Moldenke, Phytologia 11: 468 & 479. 1965.

VERBENA SCABRA Vahl

Additional bibliography: Moldenke, Phytologia 11: 479, 501, & 502. 1965.

Proctor found this plant growing at the edge of swamps in Jamaica.

Additional citations: JAMAICA: G. R. Proctor 23622 (Mi). HISPANIOLA: Dominican Republic: Fuertes 391 (Mi), 1758 (Mi).

VERBENA SCROBICULATA Griseb.

Additional bibliography: Moldenke, Phytologia 11: 137—140. 1964; Rambo, Pesquis. Bot. 21: 50. 1965.

VERBENA SELLOI Spreng.

Synonymy: Glandularia selloi (Spreng.) Troncoso, Darwiniana 13: 481. 1964. Glandularia pulchella var. gracilior Troncoso, Darwiniana 13: 476. 1964. Verbena pulchella var. gracilior (Troncoso) Shinners, Sida 2: 266. 1966.

Bibliography: Spreng. in L., Syst. Veg., ed. 16, 2: 750. 1825; Schau. in A. DC., Prodr. 11: 552. 1847; Schau. in Mart., Fl. Bras. 9: 194. 1851; Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 296—297. 1904; Hayek, Denkschr. Kaiser. Akad. Wissensch. Math.-nat. 79 (1): 294. 1908; Moldenke, Lilloa 6: 333. 1934; Troncoso, Darwiniana 3: 54. 1937; Moldenke, Phytologia 9: 389, 394, & 396. 1963; Troncoso, Darwiniana 13: 468—470 & 481—484, fig. 6. 1964; Moldenke, Résumé Suppl. 13: 3. 1966.

Illustrations: Troncoso, Darwiniana 13: 483, fig. 6. 1964.

Troncoso (1964), in resurrecting this species from synonymy, cites the following specimens: URUGUAY: Burkart 21553 (Si); Collector undesignated s.n. [Carrasco, II. 1835] (P); Felippone 3071 (Si), 2240 (Si), 2725 (Si), 2742 (Si), 2784 (Si), 2874 (Si), 3386 (Si); Herb. Herter 87430 (Si); Herter 68181 (Si); Langeron s.n. [Carrasco, II.1927] (P); Osten 5642 (Si); H. L. Parker s.n. [Carrasco, 23.X.1942] (Si—25668); Rosengurtt 1004 (Si), 2116 (Si), B.182 (Si); Rosengurtt & al. 1433 (Si).

She describes the species as follows: "Planta perenne, rastrera, radicante en todos los nudos formando céspedes extensos, ramas floriferas erguidas. Tallos subtetrágonos verde-violáceos, lisos, glabrescentes o con pubescencia híspida, extendida o retrorsa en tallos y pedúnculos, mas densa hacia el extreme de los mismos. Entrenudos breves, de 0,5—2 cm long. alargándose hacia el ápice de las ramas hasta 5 cm long. Hojas pinnatisectas, de 0,7—2 cm (raro mayores) long. x 0,5—1,5 cm lat., de ámbito triangular,

enangostadas en breve pecíolo, con un fasciculo de hojitas reducidas o breves ramitas en las axilas; lacinias breves, subagudas u obtusas, con margen extendido (subrevoluto en el material seco), glabras o con pelitos rígidos, subcallosos en la base en el haz e hirsutas en el borde y nervios del envés, éste con puntos pelúcidos (visibles sub lente), nervio medio impreso en el epifilo, prominente en el hipofilo. Inflorescencia en 2 o 3 cabezuelas terminales, más rara vez solitarias, espiciformes en la fructificacion hasta de 4 cm long., pedunculada, pedúnculos laterales, generalmente más largos que el central, con pelitos hispidos extendidos o retrorsos. Brácteas lanceoladas, subuladas, de 4—5 (—6) mm long., pestañosas, el resto glabras. Cáliz cilindrico, verdoso-violáceo, de 7—8 mm long. (incluidos los dientes), hirsuto sobre las costillas, el resto hispídulo o subglabro, dientes desiguales, subulados, los mayores de 1 mm long., rectos. Brácteas y costillas de cáliz con brevísimas glándulas patelliformes, subsésiles. Corola pubescente exteriormente en el ápice del tubo y base de la cara inferior de los lóbulos, tubo de 1 cm long. Estambres típicos, los superiores con apéndices anterales cilíndricos que superan notablemente las tecas, exertos en la garganta corolar. Gineceo típico, estilo filiforme de 0,8—1 cm long. Mericarpios cilíndricos, pardúscos, de 2,8—3 mm long., redondeados y alveolados en el ápice, truncados en la base, cara dorsal alveolado-sureada, cara ventral blanco-verrucosa, pericarpio levemente prolongado en la base, pero no ensanchado."

She notes that the species is "Abunda en praderas arenosas del litoral marítimo uruguano." She also comments that "Esta especie es muy característica y fácilmente diferenciable de sus afines por formar densos y extendidos céspedes muy floríferos y por su pubescencia en general hirsuta y los pedúnculos híspido-retrorsos." "Si bien la descripción de Sprengel es muy breve, es en todo bastante coincidente, por lo cual creo conveniente rehabilitar este antiguo nombre, pues de no hacerlo deberia describirse como un nuevo taxón."

Collectors describe this plant as 1—2 dm. tall, the corollas varying from blue, bluish, or purplish-blue to violet, lilac, purple, bright purple-lilac, or reddish. They have found it growing in dry sunny sandy or dry rocky campos, dry sandy pastures, and maritime meadows, as well as on grassy slopes, at altitudes of 10—2000 meters, flowering from September to February and in April. The common names "margarita morada" and "yerba meona" are recorded by Herter in Uruguay. Swallen describes it as very common along roadsides in campo, while Smith refers to it as littoral.

Material of V. selloi has been misidentified and distributed in herbaria under the names V. dissecta Willd., V. erinoides Lam., V. laciniata (L.) Briq., V. microphylla H.B.K., V. pulchella Sweet, V. tenera Spreng., and V. temuisecta Briq. The Chicchi 264 collection, cited below, is a mixture with V. hookeriana (Covas & Schnack) Moldenke. The label on the Rosengurtt B.2116 specimen, also cited below, originally was inscribed "B-2116 1/2", but the fraction was apparently later crossed out.

The flowers are described as "blue" on Berro 134, 4753, 4754, 6720, & 8219; "blue or violet" on Berro 4752; "purplish-blue" on Berro 8205; "bluish" on Berro 8390; "violet" on Berro 4323, Krapovickas 2752, and Burkart 22380; "reddish" on Schreiter 6643; "lilac" on Herter 181i; "purple" on Berro 8701 & 8775; and "bright purple-lilac" on Herb. Herter 50882.

The Chicchi 264, in part, Gallinal, Aragone, Bergalli, Campal, & Rosengurtt 1433 & 1821, Herb. Herter 50882, Herb. Jussieu s.n., and Rosengurtt B.2116, cited below, were all previously erroneously cited by me as V. dissecta Willd.; all the rest cited below were previously cited by me as V. tenera Spreng. These changes in determination are due, in large part, to the splendid revisionary work recently published by Troncoso (1964) on certain Argentine members of this species complex. It is probable that most of the material cited by me previously under V. tenera will prove, upon re-examination, to be V. selloi. The Bailetti 231, cited below, is placed here tentatively. It was originally distributed as V. erinoides Lam., then cited by me as V. dissecta Willd. Its leaves have the exact appearance of those of V. dissecta, but its inflorescences are those of V. selloi. It may possibly represent a hybrid between the two species.

Troncoso (1964) says for her V. pulchella var. gracilior: "A typo differt: planta humilior, repens, humifusa; caules ramaeque graciles, ad nodos floriferos radicantes, pubescencia strigosa, sparsa; folia minores." The type of the variety was collected by Arturo Burkart (no. 22380) at Villa Gesell, Gral. Madariaga, Buenos Aires, Argentina, on March 5, 1961, and is deposited in the herbarium of the Instituto Botanico Darwinion at San Isidro. She cites also from Buenos Aires Hicken s.n. [Gral. Pinto, 10-I-1898] (Si), s.n. [Olivos, barrancas, 30-III-1929] (Si), and Nicora 2014 (Si). I have, however, examined an isotype of this taxon in the United States National Herbarium and find it to be identical with typical V. selloi. Shinners (1966) maintains that it is the correct name for what has hitherto passed as V. tenuisecta Briq.

Citations: BRAZIL: Rio Grande do Sul: Rambo 34719 (N); Swallen 7391 (W--1903226). URUGUAY: H. H. Bartlett 20821 (W--1907610); Berro 134 (N), 4323 (N), 4752 (N), 4753 (N), 4754 (N), 6720 (N), 6800 (N), 8205 (N), 8219 (N), 8390 (N), 8701 (N), 8702 (N), 8775 (N); A. Castellanos s.n. [1.XI.1946; Herb. Inst. Miguel Lillo 15774] (N), s.n. [26.XII.1946; Herb. Inst. Miguel Lillo 11755] (N, N), s.n. [18.I.1947; Herb. Inst. Miguel Lillo 15138] (N, N), s.n. [7.XII.1947; Herb. Inst. Miguel Lillo 11768] (N), s.n. [9.XII.1947; Herb. Inst. Miguel Lillo 11766] (N); Felippone 5915 (N); Gallinal, Aragone, Bergalli, Campal, & Rosengurtt 1433 (N), 1821 (N), 2299 (W--1742790); Herb. Herter 50882 (N); Herter 181c [Herb. Herter 79227] (N), 181i [Herb. Herter 96600] (N); Herter & Strahl 181 [Herb. Herter 79174] (N); Legrand 2717 (N); Moldenke & Legrand s.n. [Herb. Legrand 2791]; Moldenke & Moldenke 19692 (N), 19696 (N);

Rosengurtt B.2116 (N); A. Saint-Hilaire C^2.1882 (N); H. M. Smith 140 (W—1193793); Teague s.n. [22.II.1947; Herb. Inst. Miguel Lillo 11760] (N, N). ARGENTINA: Buenos Aires: Burkart 22380 (W—2371533); Krapovickas 2752 (N). Corrientes: Edw. Palmer s.n. [La Plata Exped. Capt. Page] (W—227527). La Pampa: Chicchi 264, in part (N). Salta: Garolera & Romero s.n. [Cuesta del Obispo, 8.I. 1947] (N); Schreiter 6643 [Herb. Inst. Miguel Lillo 32795] (N). Tucumán: Bailetti 231 [Herb. Inst. Miguel Lillo 31690] (N). CULTIVATED: Russia: Herb. Hort. Bot. Petrop. s.n. (W—71959). LOCALITY OF COLLECTION UNDETERMINED: Herb. Jussieu s.n. (N).

VERBENA SESSILIS (Cham.) Kuntze

Additional bibliography: Hocking, Excerpt. Bot. A9: 366. 1965; Moldenke, Phytologia 11: 479. 1965.

Additional citations: BRAZIL: State undetermined: Sellow 1563 [Macbride photos 17447] (W—photo of type).

VERBENA SIMPLEX Lehm.

Additional bibliography: Turcz., Bull. Soc. Nat. Mosc. 36 (2): 195. 1863; N. L. Britton, N. J. Geol. Surv. Final Rep. State Geol. 2 (1): 194. 1889; Quick, Wild Fls. North. States 372—373. 1939; M. J. Cuthbert, How to Know Spring Fls. 110, fig. 297a. 1943; Moldenke, Biol. Abstr. 46: 3246. 1965; Hocking, Excerpt. Bot. A9: 366. 1965; Moldenke, Phytologia 11: 480 (1965) and 13: 185. 1966; Gaiser, Surv. Vasc. Pl. Lambton Co. 100. 1966.

Additional illustrations: M. J. Cuthbert, How to Know Spring Fls. fig. 297a. 1943.

Additional citations: ALABAMA: DeKalb Co.: Demaree 50551 (Ac). MISSOURI: Saint Louis: Muhlenbach 182 (Ac), 1208 (Ac), 1465 (Ac).

VERBENA SIMPLEX f. ALBIFLORA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 480. 1965; Moldenke, Biol. Abstr. 46: 3246. 1965; Hocking, Excerpt. Bot. A9: 367. 1965.

xVERBENA SOLBRIGII Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 35: 1688. 1960; Hocking, Excerpt. Bot. A4: 592. 1962; Moldenke, Phytologia 11: 480. 1965.

VERBENA STELLARIOIDES Cham.

Additional bibliography: Rambo, Pesquis. Bot. 21: 51, 53, & [60]. 1965; Moldenke, Phytologia 11: 480. 1965.

Rambo (1965) suggests that V. ramboi Moldenke may be conspecific with V. stellarioides. Under the latter, he cites Herb. Anchieta 9555, 9758, 10156, and 58698 [Camargo 51] from Rio Grande do Sul, Brazil, all collected by himself except where otherwise noted. He describes the plant as "Erect, stiff, coarse, scarcely branched or unbranched, up to 50 cm high; leaves very narrow and long", growing in "Dry, grassy Campos" in the "Western

Campos only" in Rio Grande do Sul, with a general distribution of "Paraguay, westernmost RGS [Rio Grande do Sul], Uruguay".

Additional citations: BRAZIL: Rio Grande do Sul: Sellow s.n. [Macbride photos 17446] (W—photo of type).

VERBENA STOREOCLADA Briq.

Additional bibliography: Moldenke, Phytologia 11: 188—190. 1964; Rambo, Pesquis. Bot. 21: 58. 1965.

VERBENA STRICTA Vent.

Additional bibliography: N. L. Britton, N. J. Geol. Surv. Final Rep. State Geol. 2 (1): 194. 1889; W. J. Beal, Mich. Agr. Coll. Exp. Sta. Bull. 267, ed. 2, 115, fig. 175. 1915; Muenscher, Cornell Agr. Exp. Sta. Bull. 635 [Weeds N. Y.], pr. 2, 10 & 387. 1939; Rickett, New Field Book Am. Wild Fls. 280, fig. 98. 1963; Y. Matsumura, Amat. Herb. 25 (3-4): 42. 1964; Hocking, Excerpt. Bot. A9: 366. 1965; Moldenke, Phytologia 11: 462, 480, 500, & 501. 1965; F. H. Montgomery, Native Wild Pl., pr. 2, 121, fig. 210. 1965; Moldenke, Résumé Suppl. 12: 1 & 13 (1965) and 13: 1. 1966; Gaiser, Surv. Vasc. Pl. Lambton Co. 100. 1966.

Additional illustrations: W. J. Beal, Mich. Agr. Coll. Exp. Sta. Bull. 267, ed. 2, fig. 175. 1915; Rickett, New Field Book Am. Wild Fls. fig. 98. 1963; F. H. Montgomery, Native Wild Pl., pr. 2, fig. 210. 1965.

Muhlenbach 1335 was identified by the collector as "V. simplex x stricta", but I do not think that it is a hybrid. One each of the A. R. Moldenke 924 and H. N. Moldenke 21909 specimens cited previously by me as being deposited in my personal herbarium is now in the herbarium of Aarhus University. C. M. Rogers 6111 is said to have had "violet" flowers.

Additional citations: INDIANA: Porter Co.: M. W. Lyon Jr. s.n. [Baileytown, IX.13.1925] (Mi). KENTUCKY: Union Co.: Shacklette 506 (Mi). KANSAS: Crawford Co.: H. F. Becker s.n. [Pittsburgh, 3 June 1964] (Mi). MISSOURI: Saint Louis: Muhlenbach 145 (Ac), 1335 (Ac). COLORADO: Las Animas Co.: C. M. Rogers 4967 (Mi), 6076 (Mi), 6111 (Mi), 6956 (Mi). TEXAS: Hemphill Co.: Correll & Ogden 28302 (Ld), 28321 (Ld).

VERBENA STRICTA f. ALBIFLORA Wadmond

Additional bibliography: Moldenke, Phytologia 11: 480. 1965; Moldenke, Résumé Suppl. 12: 1. 1965.

Additional citations: MISSOURI: Saint Louis: Muhlenbach 435 (Z).

VERBENA STRIGOSA Cham.

Additional bibliography: Moldenke, Phytologia 11: 238—240, 498, & 500. 1965; Rambo, Pesquis. Bot. 21: 53—54 & [60]. 1965.

Rambo (1965) cites Herb. Anchieta 2817, 8492, 8602, 8783, 30981, 32450, 34728, 35217, 49319, 50961, 50999, 51940, 55928, 56274, 56628, all from Rio Grande do Sul, and 55298 [Reitz 4746]

55300 [Reitz 4742], 55303 [Reitz 4739], and 56868 [Reitz s.n.] from Santa Catarina, Brazil, all collected by himself except where otherwise noted. The Santa Catarina specimens, he says, were identified by me as V. hirta Spreng. He describes V. strigosa as a "Low shrub, densely branched from a rootstock, branches up to 30 cm high", found in "More or less wet, peaty, grassy Campos" on the "Highlands only, especially the northeastern sector" of Rio Grande do Sul, with a general distribution of "From S. Paulo to RGS [Rio Grande do Sul]".

Additional citations: BRAZIL: São Paulo: Sellow s.n. [Brasilia; Macbride photos 17448] (W--photo of isotype).

VERBENA SUBINCANA (Troncoso) Shinners, Sida 2: 266. 1966.

Synonymy: Glandularia subincana Troncoso, Darwiniana 13: 478--481, fig. 5. 1964.

Bibliography: Troncoso, Darwiniana 13: 468--470 & 478--481, fig. 5. 1964; Shinners, Sida 2: 266. 1966.

Illustrations: Troncoso, Darwiniana 13: 480, fig. 5. 1964.

Troncoso (1964) describes this species as follows: "Perennis herbacea, circ. 25 cm alt., caulibus ad basim prostratis interdum radicantibus, demum ascendentibus, subtetragonis; pubescentia apicem versus subincana, ad caules retrorso-hispidula, ad bracteas nervis foliorum calycique glandulis patelliformibus intermixta; internodiis 1--5 cm longis; foliis pinnatisectis, 1--4,5 cm longis, subtus crassinervosis, supra et subtus scabro-hirtellis, laciniis circ. 1--2,5 mm latis oblongo-lanceolatis subacutis; capitulis densis solitariis, post anthesin usque ad 7 cm elongatis, pedunculos retrorso-hispidulo; bracteis lanceolatis ciliolatis hispidulisque, 4--4,5 mm longis, dimidio calyce longioribus, persistentibus; calyce tubuloso 8--8,5 mm longo cano-hispidulo, dentibus inaequalis usque ad 1 mm longis, corolla violacea 1,2--1,5 cm longa, extus glabra, laciniis obovatis emarginatis, tubo subincurvato apicem versus incrassato; antheris glandulis cylindricis elongatis, exsertis, munitis; stylo 8,5--9 mm longo; fructu 2,5--2,8 mm longo, mericarpiis obtusis, dorso-reticulato-sulcatis.....Planta perenne, sufruticosa en la base, con tallos extendidos, rastreros o radicantes en la base, luego erguidos, sin formar césped. Ramas subtetrágonas con oubescencia híspida, extendida o retrorsa sobre los ángulos, el resto cano-hispídulo, más densa hacia el ápice dándole un aspecto blanquecino. Entrenudos breves, de 1--3 cm long, más largos hacia el extremo de la ramas, hasta de 5 cm long. Hojas pinnatisectas, con un fascículo de hojitas menores en las axilas, de 1--3 (--4,5) cm long, atenuadas en breve pecíolo, lámina de ámbito oval-triangular, hirsutas en el epifilo con pelitos rígidos, callosos en la base, más densamente en el hipofilo sobre los nervios y el margen subrevoluto (visto en material seco), nervio medio impreso arriba, prominente abajo; lacinias oblongo-lanceoladas, subagudas u obtusas, enteras o dentadas, de 1--1,5 mm lat. Inflorescencia en densas cabezuelas terminales, solitarias, que se alargan en la fructificación hasta 7 cm long, pedúnculo híspido y cano-hispídulo con pubescencia retrorsa. Brácteas lanceoladas, subcóncavas

en la base, de 4--4,5 mm long, generalmente superando la 1/2 del cáliz, nervio medio manifiesto, pestañosas, el resto incano-hispídulo, persistentes sobre el raquis después de la fructificación. Cáliz cilíndrico-tubuloso, de 8--8,5 mm long. (incluido los dientes), cano-hispídulo en toda su superficie, más densamente en la 1/2 inferior y con pelitos más rigidos y oblicuos hacia el ápice de la costillas y los dientes, ciliolado en el borde, dientes desiguales, subulados, los mayores de 1 mm long., ensanchados y membranáceos en la base; cáliz fructifero plegado en el ápice por encima de los mericarpios. Brácteas, cáliz y nervios del envés de la hojas con pequeñas glándulas pateliformes. Corola violácea, morada o lila azulada (según los coleccionistas), de 1,2--1,5 cm long., lóbulos obovales, escotados, temuemente nerviados (sub lente), glabra exteriormente; tubo de 1--1,2 cm long., brevemente encorvado y ampliado en la parte superior. Estambres típicos, los superiores con apéndices anterales cilíndricos, superando las tecas y asomando en la garganta corolar, Gineceo típico, estilo de 8,5--9 mm long. Mericarpios de 2,5--2,8 mm long., recubiertos por el cáliz persistente que a la madurez se hiende lateralmente, cilíndricos, redondeados en el ápice y truncados en la base, ápice y 1/2 superior del dorso alveolado el resto surcado, cara ventral blanco-verrucoso (sublente), pericarpio prolongado por debajo de la parte fértil, no ensanchado. Habita laderas pratenses, en suelos arenosos.....Especie afín a Gl. *selloi*, de la que se diferencia por su pubescencia cano-hispídula en brácteas, cáliz y pedúnculos, por su corola glabra exteriormente y en general por ser toda ella mucho más hirsuta y no formar céspedes densos. De Gl. *pulchella* se aparta por la pubescencia, no estrigosa y por los mericarpios menores y redondeados en el ápice, no rostrados." She cites from Entre Ríos, Argentina, Burkart 25425 (Si) and from Uruguay Rosengurtt & al. 492 (Si) and PE.5262 (Si).

The type of the species was collected by Bernardo Rosengurtt Gurvich (no. B.992), common in riverside thickets at Arroyo Valentín, Río Arapey, dept. Salto, Uruguay, on January 28, 1937, and is deposited in the herbarium of the Instituto Botanica Darwinion at San Isidro, Argentina. This collection was cited by me in previous works as V. *pulchella* Sweet.

Collectors describe V. *subincana* as prostrate or ascending, stoloniferous, the corollas varying from lilac or violet to purple. They have found it growing in riverside thickets, rocky fields, and low or dry rocky sunny sandy campos, as well as on grassy slopes, at 150 meters altitude, flowering in September, October, January, and February. Rambo says "Species in toto planalto, praesertim in rupestribus valde communis" in Rio Grande do Sul, Brazil. The flowers are described as "lilac" on Rosengurtt B.992, "violet" on Herter 181g, and "purple" on Rosengurtt B.3756 and Gallinal, Aragone, Bergalli, Campal, & Rosengurtt PE.5262.

The Brade 7000, Gallinal, Aragone, Bergalli, Campal, & Rosengurtt PE.5262, Löfgren s.n. [22-9-1887; Herb. Com. Geogr. e Geol.

3685; Herb. Inst. Bot. S. Paulo 15725], Rambo 10103, and Rosengurtt B.3756, cited below, were previously cited erroneously by me as V. dissecta Willd., while J. T. Lima s.n. [II.1946; Herb. Rio de Jan. 55466] was erroneously cited by me as V. pulchella Sweet.

Citations: BRAZIL: Rio Grande do Sul: Rambo 10103 (N). São Paulo: Brade 7000 [Herb. Inst. Bot. S. Paulo 6728] (N, N); J. T. Lima s.n. [II.1946; Herb. Rio de Jan. 55466] (N); Löfgren s.n. [22-9-1887; Herb. Com. Geogr. & Geol. 3685; Herb. Inst. Bot. S. Paulo 15725] (N). URUGUAY: Gallinal, Aragone, Bergalli, Campal, & Rosengurtt PE.5262 (N, N); Herter 181g [Herb. Herter 83911] (N); Rosengurtt B.992 (N--isotype), B.3756 (N, N).

VERBENA SULPHUREA D. Don

Additional bibliography: Hocking, Excerpt. Bot. A9: 366. 1965; Moldenke, Phytologia 11: 480--481 (1965) and 13: 213. 1966; Moldenke, Résumé Suppl. 13: 3. 1966.

The Herb. Inst. Miguel Lillo 31745 and Jörgensen 1613, distributed as V. sulphurea, are actually V. parodii (Covas & Schnack) Moldenke, not V. dissecta Willd. as stated by me previously.

Additional citations: CHILE: Coquimbo: Marticorena & Matthei 74 (Ac), 105 (Ac), 230 (Ac); Ricardi 2028 (Ac); Ricardi & Marticorena 4236/621 (Ac). Valparaíso: Behn s.n. [Viña del Mar, 19.XI.1922] (Ac); Junge s.n. [Quinteros, 9.XI.1942] (Ac).

VERBENA SULPHUREA f. ALBA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 480. 1965; Moldenke, Résumé Suppl. 13: 3. 1966.

Additional citations: CHILE: Valparaíso: F. Torres s.n. [Quintero, 19.IX.1958] (Z).

VERBENA SULPHUREA var. TALTALENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 11: 481. 1965; Moldenke, Résumé Suppl. 13: 3. 1966.

Recent collectors have found this plant in flower and fruit in October.

Additional citations: CHILE: Antofagasta: Ricardi 2701 (Ac), 3090 (Ac). Coquimbo: Marticorena & Matthei 350 (Z).

VERBENA SUPINA L.

Additional bibliography: Hocking, Excerpt. Bot. A9: 366. 1965; Moldenke, Phytologia 11: 251--261 & 490. 1965.

VERBENA TENERA Spreng.

Additional bibliography: Troncoso, Darwiniana 13: 468--473, fig. 1. 1964; Hocking, Excerpt. Bot. A9: 366. 1965; Rambo, Pesquis. Bot. 21: 54-55 & [60]. 1965; Moldenke, Phytologia 11: 458, 468, 481 & 485. 1965.

Additional illustrations: Troncoso, Darwiniana 13: 472, fig. 1.

1964.

Smith and his collaborators found this plant growing in dry open ground and on rock outcrops, as well as in bogs, in Santa Catarina.

Rambo (1965) cites Herb. Anchieta 9389, 9913, 10005, 10103, 25789, 34719, 28352, 53317, 60504 [Sacco s.n.], 61292 [Pivetta 1155], 61443 [Sacco 646], 61444 [Sacco 647], 63207 [Spies s.n.], and 63244 [Spies s.n.] from Rio Grande do Sul, Brazil, all collected by himself except where otherwise noted. He describes the species as "Prostrate, base generally a little elevated branches radiating, up to 40 cm long", growing in "Dry, more or less open to grassy Campos" in the "Western to central Campos area, absent from the northeastern quadrant" in Rio Grande do Sul, with a general distribution "From Rio de Janeiro to Uruguay and northern Argentina".

Troncoso (1964) describes the species as follows: "Herbácea perenne, sufruticosa en la base, rastrera, muy extendida, con ramas floríferas ascendentes, subglabra a ralamente estrigoso-pubescente más densa en la región de la inflorescencia. Ramas delgadas, subcilíndricas, entrenudos de 2--3 cm long. Hojas pinnatisecta, de ámbito triangular, de 1,5--3 cm long., con un fascículo de hojitas menores o ramitas abreviadas en las axilas, lacinias filiformes de 0,5--1 mm diám., por lo general enteras, subagudas, subrectas (incurvadas en el material seco), glabrescentes o con pelitos estrigosos ralos en ambas caras, nervio medio unico inconspicuo en el epifilo, bordes extendidos, a veces en el material de herbario parecen subrecurvos. Inflorescencia en cabezuelas terminales solitarias, pedunculadas, especiformes, en la fructificación hasta de 7 cm long. Brácteas ovales u ovallanceoladas de 2--3,5 mm long., con nervio medio visible, subcóncavas en la base, estrigosas. Cáliz cilíndrico, de 9,5--9 mm long. (incluidos los dientes), densamente estrigoso-pubescente en toda su superficie, dientes desiguales subulados, subrectos, los mayores de 1 mm long., conniventes o contortos en el cáliz fructífero. Brácteas y cáliz con glandulitas pateliformes, subsésiles, Corola glabra exteriormente, tubo de 12--13 mm long. Estambres típicos, los superiores con apéndices anterales cilíndricos sobrepasando las tecas y exertos. Pistilo típico, estilo filiforme, de 10,5--11 mm long. Mericarpios cilíndricos, de 4,7--5,5 (--6,5) mm long., notablemente rostrados, rostro liso, dorso pardo negruzco, alveolado-estriado, cara ventral blanco-verrucosa, pericarpio dorsal prolongado y ensanchado en la base."

She notes "Habita principalmente en terrenos arenosos....Especie muy vecina de Gl. pulchella var. pulchella, pero ésta se diferencia por las lacinias de las hojas más anchas, toda la planta más densamente pubescente, mericarpios menores y con rostro reducido y en general por su hábito mucho más robusto y sus tallos apoyantes, radicantes sólo en la base.....Destaco que Grisebach en Symb. ad Flor. Argent. p. 277. 1879, al citar la especie para E. Ríos, Urug-Bonar. señala: 'verae speciei folii segmenta angustissima (1/3 lin. fere lata), glabriuscula, corolla longius exserta et

caulis suffruticosus". Los ejemplares uruguayos estudiadosse hallan determinados por el Dr. C. Osten y coinciden exactamente con el concepto de Grisebach." She cites: ARGENTINA: Entre Ríos: Burkart 23094 (Si), 3616 (Si); Herb. Inst. Darwin. 12174 (Si); Lorentz 1483 (Bf); Ragonese & Martinez Crovetto 49 (Ib, Si), 5006 (Si); Rivas s.n. [Holt, 15-XI-1924] (Ib—77616). URUGUAY: Berro s.n. [Mercedes] (Ug); Millot s.n. [Herb. Rosengurtt]; Osten 16546 (Ug).

She proposes the following key to distinguish this species from its relatives:

1. Pubescencia estrigosa rala o densa en tallos, hojas, cáliz y brácteas; pedúnculos con pelos aplicados, acroscópicos; cáliz estrigoso o cano-estrigoso en toda su superfície.
   2. Dientes del cáliz subulados o apiculados, ensanchados en la base, rectos o subrectos; apéndices anterales exertos, superando las tecas; mericarpios de ápice rostrado o subrostrado y base dorsal del pericarpio ensanchada.
      3. Segmentos de las hojas filiformes, de 0,5—1 mm lat., subglabros, bordes extendidos; brácteas ovales u oval-lanceoladas, de 1/3—1/4 la longitud del cáliz, rara vez mayores; mericarpios de 4,5—5,5 (—6,5) mm long., largamente rostrados.....V. tenera.
      3a. Segmentos de las hojas linear-lanceolados, de 1—2 mm lat., más densamente estrigosos, borde revoluto o subrevoluto; brácteas lanceoladas, igualando o superando da 1/2 del cáliz; mericarpios de 3,5—4 mm long., brevemente rostrados.....V. pulchella.
   2a. Dientes del cáliz setoso-filiformes, recurvos, sub-truncados en la base; apéndices anterales inclusos, no superando las tecas; mericarpios redondeados en el ápice, pericarpio no ensanchado en la base.....V. tenuisecta.
1a. Pubescencia híspida o hirsuta en tallos, hojas, cáliz y brácteas; pedúnculos con pelos extendidos o más comúnmente retrorsos, basiscópicos; cáliz hirsuto sobre las costillas, el resto subglabro o cano-hispídulo.
   4. Inflorescencia en cabezuela solitaria; tubo corolar glabro exteriormente; cáliz y brácteas cano-hispídulas, con pelitos más rigidos sobre las costillas del cáliz.V. subincana.
   4a. Inflorescencia en 2 ó 3 cabezuelas terminales, o cimoso-paniculada; tubo corolar pubescente exteriormente; cáliz y brácteas hiesutas.
      5. Cabezuelas 2 ó 3 terminales, rara vez solitarias, alargándose después de la antesis; brácteas lanceoladas, largamente subuladas.....V. selloi.
      5a. Cabezuelas cimoso-paniculadas, inflorescencia 2 ó 3 veces tricótoma, corimbiforme; cabezuelas no alargándose después de la antesis; brácteas ovales, agudas..V. dissecta.

It is very probable that most of the Uruguayan material cited by me previously as V. tenera actually represents V. selloi according to this revision made by Troncoso. Burkart 22380, which I

cited previously as V. tenera, is the type collection of V. pulchella var. gracilior (Troncoso) Shinners, but this I regard as a synonym of V. selloi Spreng. Burkart 3616, which she cites as V. tenera, I have previously cited as V. tenuisecta Briq.

The flowers are described as "blue" on Schreiter 1904. The Moreno s.n. [Patagon. 1882/4], Schreiter 1904, Tweedie s.n., and Wilkes Exped. s.n., cited below, were previously erroneously cited by me as V. dissecta Willd., while Carette s.n. [Monte Hermoso, 1916] was previously cited by me in error as V. microphylla H.B.K.

On the other hand, the Boffa 25 and Commerson s.n. [Buenos Ayres et Monte Video], previously cited by me as V. tenera, are actually V. dissecta Willd.; A. Castellanos s.n. [23.I.1947; Herb. Inst. Miguel Lillo 15120] is V. mendocina R. A. Phil.; A. T. Hunziker 6471 and T. Meyer 2409 are V. microphylla H.B.K.; Herb. Inst. Miguel Lillo 31472, Jörgensen 1737, and Ruíz Leal 7092 are V. parodii (Covas & Schnack) Moldenke; A. T. Hunziker 5160 is V. pogostoma Klotzsch; H. M. Smith 5 is V. pulchella Sweet; H. H. Bartlett 20821, Berro 134, 4323, 4752, 4753, 4754, 6720, 6800, 8205, 8219, 8390, 8701, 8702, & 8775, Burkart 22380, A. Castellanos s.n. [1.XI.1946], s.n. [26.XII.1946], s.n. [18.I.1947], s.n. [7.XII.1947], & s.n. [9.XII.1947], Felippone 5915, Gallinal, Aragone, Bergalli, Campal, & Rosengurtt 2299, Garolera & Romero s.n. [Cuesta del Obispo, 8.I.1947], Herb. Inst. Miguel Lillo 11755, 11760, 11766, 11768, 15138, 15774, & 32795, Herb. Herter 79174, 79227, & 96600, Herb. Hort. Bot. Petrop. s.n., Herter 181c & 181i, Herter & Strahl 181, Krapovickas 2752, Legrand 2717, Moldenke & Legrand s.n. [Herb. Legrand 2791], Moldenke & Moldenke 19692 & 19696, Edw. Palmer s.n. [La Plata Exped. Capt. Page], Rambo 34719, A. Saint-Hilaire C2.1882, Schreiter 6643, H. M. Smith 140, Swallen 7391, and Teague s.n. [22.II.1947] are V. selloi Spreng.; and A. T. Hunziker 3333 and Malme 348 are V. tenuisecta Briq. The Gallinal, Aragone, Bergalli, Campal, & Rosengurtt 1433 & 1821 and Rosengurtt B.2116, originally distributed as V. tenera and cited by me previously as V. dissecta Willd., are actually V. selloi Spreng.

Additional citations: BRAZIL: Santa Catarina: Reitz & Klein 7919 (W—2403363); Smith & Klein 13388 (Ac), 13730 (W—2451591); Smith & Reitz 14372 (W—2451603). URUGUAY: Sellow 99 [Macbride photos 17450] (W—photo of type). ARGENTINA: Buenos Aires: Carette s.n. [Monte Hermoso, 1916] (N). Río Negro: U. S. Expl. Exped. [Wilkes] s.n. (T). Tucumán: Schreiter 1904 [Herb. Inst. Miguel Lillo 32759] (N). Province undetermined: Moreno s.n. [Patagon. 1882/4] (N). LOCALITY OF COLLECTION UNDETERMINED: Tweedie s.n. (N).

VERBENA TENUISECTA Briq.

Additional synonymy: Verbena temuisecta Brig., in herb. Verbena teniusecta Brig., in herb.

Additional bibliography: Moldenke, Biol. Abstr. 36: 719. 1961; Hocking, Excerpt. Bot. A5: 44. 1962; Sharp & Baker, Castanea 29: 183. 1964; Troncoso, Darwiniana 13: 468--470 & 477--478, fig. 4. 1964; Moldenke, Phytologia 11: 448, 481, 485, & 486. 1965; Neal, In Gard. Hawaii, new rev. ed., 722. 1965; Hocking, Excerpt. Bot. A9: 366. 1965; Rambo, Pesquis. Bot. 21: 58. 1965; Moldenke, Résumé Suppl. 12: 1, 2, & 13 (1965) and 13: 6. 1966; Shinners, Sida 2: 266. 1966.

Additional illustrations: Troncoso, Darwiniana 13: 477, fig. 4. 1964.

Recent collectors have found this plant growing in black clay, sandy loam, calcareous marl, and in fine sandy silt. Godfrey reports it "abundantly naturalized along roadsides" in North Carolina.

Troncoso (1964) describes this species as follows: "Hierba perenne, rastrera, de ramas extendidas, radicantes, las extremidades floríferas ascendentes, cilíndricas a subtetrágonas, glabrescentes o pilosiúsculas, más densamente pubescentes hacia el ápice. Entrenudos breves, de 1,5--3 cm long. Hojas pinnatisectas, con fascículos de hojas menores en las axilas, lámina de ámbito triangular, atenuada en pecíolo, de 2--3 cm long., laciniaas lineares, subrectas, subagudas, enteras o dentadas, margen extendido a subrevoluto (en material seco), impresas en el epifilo, con un nervio central prominente en el hipofilo, estrigosas en el haz y sobre el nervio medio en el envés, el resto glabrescente. Inflorescencia terminal, en cabezuelas solitarias, capituliformes en el floración, alargándose luego en densas espigas, hasta de 8 cm en la fructificación. Brácteas oval-lanceoladas, subuladas, de 3--3,5 mm long., estrigosas. Cáliz cilíndrico, de 8--9 mm long (incluídos los dientes), densamente cano-estrigoso, con pocas glándulas pateliformes, subsésiles; dientes súbitamente setoso-filiformes, desiguales, los mayores de 2--3 mm long., generalmente recurvos. Corola glabra, tubo de 11--12 mm long., garganta ciliada. Estambres típicos, los superiores con apéndices anterales reducidos, no superando las tecas ni la garganta corolar. Gineceo típico, de 0,9--1 cm long. Mericarpios pardo-negruzcos, cilíndricos, de 2,5,3 mm long., redondeados en el ápice, truncados, no o apenas ensanchados en la base, ápice y dorso reticulado en la mitad superior, el resto estriado, cara ventral blanco-verrucosa o sublisa. Area: Paraguay y NE argentino.....Especie muy vecina por su hábito de G. pulchella y Gl. tenera, de las que se diferencia por los dientes del cáliz, setoso-filiformes, de base subtruncada y por los mericarpios más pequeños, de ápice redondeado, no rostrado." She cites from Paraguay Hassler 1603 (Si), Jörgensen 3771, and T. Rojas 2528 (Si) & 2536 (Si).

Shinners (1966) maintains that the correct name for this taxon is V. pulchella var. gracilior (Troncoso) Shinners, but this name

belongs in the synonymy of V. selloi Spreng.

The Burkart 3616, cited by me previously as V. tenuisecta, is regarded by Troncoso (1964) as representing V. tenera Spreng. instead.

Recent collectors have found V. tenuisecta growing in dry or somewhat moist sandy rather open places in Rio Grande do Sul, Brazil. The flowers are described as "violet" on A. T. Hunziker 3333. This collection and Malme 348, cited below, were previously erroneously cited by me as V. tenera Spreng. Material of V. tenuisecta has been misidentified and distributed in herbaria as V. ciliata Benth.

Additional citations: SOUTH CAROLINA: Dillon Co.: R. K. Godfrey SC.49027 (Ld). ALABAMA: Crenshaw Co.: C. T. Reed 2025 (Ld). LOUISIANA: Jeff Davis Par.: R. L. Crockett 8313 (Ld). TEXAS: Jasper Co.: D. S. Correll 27427 (Ld). Jefferson Co.: R. L. Crockett 8418 (Ld). Nueces Co.: B. E. Campos 41-A (Au--232472). Starr Co.: P. Cabrera 87 (Au--232474). Tyler Co.: R. L. Crockett 6707 (Ld). Webb Co.: L. R. Cuesta 28 (Ld). Zapata Co.: Balleza & Valdez 169 (Ld); Flores & Powell 106 (Ld). BRAZIL: Rio Grande do Sul: Malme 348 (N). PARAGUAY: Hassler 6144 [Macbride photos 17451] (W--photo). ARGENTINA: Buenos Aires: A. T. Hunziker 3333 (N). Córdoba: Hieronymus s.n. [Córdoba, 14/11/1876] (Mi). Formosa: Morel 530 (Mi). CULTIVATED: India: Khoshoo 2 (Ac), 3 (Ac), s.n. [National Botanic Gardens, Lucknow] (Ac). Texas: Y. Villarreal 20 (Au—232446), 253 (Ld).

VERBENA TENUISECTA var. ALBA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 448 & 481. 1965; Moldenke, Résumé Suppl. 12: 1 & 2 (1965) and 13: 6. 1966.

Recent collectors have found this plant growing in fine sandy silt, fruiting in February.

Additional citations: LOUISIANA: Sabine Par.: Demaree 48315 (Ac). MEXICO: Tamaulipas: E. Villanueva 39 (Au—232442). CULTIVATED: India: Khoshoo 4 (Ac).

VERBENA TENUISECTA var. GLABRATA Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 36: 719. 1961; Hocking, Excerpt. Bot. A5: 44. 1962; Moldenke, Phytologia 11: 303—304. 1965.

VERBENA TEUCRIIFOLIA Mart. & Gal.

Emended synonymy: Verbena teucrifolia Mart. & Gal. ex Moldenke, Résumé Suppl. 7: 10, in syn. 1963; Hocking, Excerpt. Bot. A9: 366. 1965.

Additional bibliography: Moldenke, Phytologia 11: 305—311 & 490. 1965; Beamann, Bol. Soc. Bot. Mex. 29: [71] & 74. 1965; Hocking, Excerpt. Bot. A9: 366. 1965.

Recent collectors have found this plant growing in Pinus pat-

ula woods, and material has been misidentified and distributed in herbaria as Rubiaceae.

Additional citations: MEXICO: Federal District: Powell & Edmondson 746 (Mi). Tlaxcala: V. Aguilar 8-A-21 (Ip). Vera Cruz: Dodds 99 (Mi); Vela G. 1227 (Ip).

VERBENA THYMOIDES Cham.

Additional bibliography: Rambo, Pesquis. Bot. 21: 54--55 & [60]. 1965; Moldenke, Phytologia 11: 311--314. 1965.

Smith & Klein found this plant growing in bogs and on river-banks in Santa Catarina, Brazil.

Rambo (1965) cites Herb. Anchieta 2790, 4538, 9407, 11850 [Augusto s.n.], 29122, 31077, 34132, 34725, 36415, 37491, 37827, 40857, 43564, 45091, 48873, 57608 [Pivetta 629], 58722 [Camargo 35], 58730 [Camargo 216], 58767 [Camargo 105], & 61302 [Pivetta 1135] from Rio Grande do Sul, and 31758, 35979 [Hatschbach 500], and 49579 from Santa Catarina, all collected by himself except where otherwise noted. He describes the plant as "Slender, erect to recumbent, up to 1 m high", growing in "Dry Campos, among dense and tall grasses.....Over the whole Campos area, not frequent" in Rio Grande do Sul, with a general distribution "From S. Paulo and Paraguay through South Brazil to Uruguay".

Additional citations: BRAZIL: Santa Catarina: Sellow 1482 [Macbride photos 17454] (W--photo of cotype); Smith & Klein 13610 (W--2451608).

VERBENA TUMIDULA Perry

Additional bibliography: Moldenke, Phytologia 11: 325--326 (1965) and 13: 191. 1966.

The E. G. Marsh 1822 distributed as V. tumidula is actually V. delticola Small.

VERBENA URTICIFOLIA L.

Additional bibliography: N. L. Britton, N. J. Geol. Surv. Final Rep. State Geol. 2 (1): 194. 1889; Mrs. W. S. Dana, How to Know Wild Fls., rev. ed., 122, 365, & 372. 1896; W. J. Beal, Mich. Agr. Coll. Exp. Sta. Bull. 260: 153, fig. 154 (1910) and 267, ed. 2, 116, fig. 176. 1915; Muenscher, Cornell Agr. Exp. Sta. Bull. 635 [Weeds N. Y.], pr. 2, 10 & 387. 1939; Quick, Wild Fls. North. States 372 & 518. 1939; Moldenke, Biol. Abstr. 36: 719. 1961; Hocking, Excerpt. Bot. A5: 44. 1962; Rickett, New Field Book Am. Wild Fls. 280, fig. 98. 1963; H. L. Hoffman, Castanea 29: 31 & 45. 1964; Moldenke, Phytologia 11: 502. 1965; Hocking, Excerpt. Bot. A9: 366. 1965; Cody, Ind. Sem. Pl. Res. Inst. Ottawa 1965: 31. 1965; Moldenke, Résumé Suppl. 12: 1 (1965) and 13: 1. 1966; Cody, Ind. Sem. Bot. Gard. Ottawa 1966: 19. 1966; Gaiser, Surv. Vasc. Pl. Lambton Co. 100. 1966.

Additional illustrations: W. J. Beal, Mich. Agr. Coll. Exp. Sta. Bull. 260, fig. 154 (1910) and 267, ed. 2, fig. 176. 1915; Rickett, New Field Book Am. Wild Fls. fig. 98. 1963.

Additional citations: VERMONT: Windsor Co.: A. R. Moldenke 1130 (Ac), 1132 (Ac). INDIANA: Porter Co.: M. W. Lyon Jr. s.n. [Keiser, VIII.10.1924] (Mi). TENNESSEE: Cheatham Co.: Demaree 51102 (Ac). MISSOURI: Saint Louis: Muhlenbach 993 (Ac), 1041 (Ac), 1286 (Ac), 1293 (Ac), 2004 (Ac), 2135 (Ac). TEXAS: Bowie Co.: D. S. Correll 31288 (Ld).

VERBENA URTICIFOLIA var. INCARNATA (Raf.) Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 36: 719. 1961; Hocking, Excerpt. Bot. A5: 44. 1962; Moldenke, Phytologia 11: 410--411. 1965.

xVERBENA URUGUAYENSIS Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A9: 367. 1965; Moldenke, Phytologia 11: 420--421. 1965.

xVERBENA VAGA Moldenke

Additional synonymy: xVerbena vaca Moldenke ex Hocking, Excerpt. Bot. A9: 367, sphalm. 1965.

Additional bibliography: Moldenke, Phytologia 11: 421. 1965; Hocking, Excerpt. Bot. A9: 367. 1965.

VERBENA VALERIANOIDES H.B.K.

Additional bibliography: Moldenke, Phytologia 11: 481--482. 1965.

Additional citations: COLOMBIA: Cundinamarca: Humboldt & Bonpland s.n. [Macbride photos 39476] (W--photo of type).

VERBENA VARIABILIS Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A9: 367. 1965; Moldenke, Phytologia 11: 482. 1965.

VERBENA VENTURII Moldenke

Additional bibliography: Hocking, Excerot. Bot. A9: 367. 1965; Moldenke, Phytologia 11: 482--483. 1965.

VERBENA VILLIFOLIA Hayek

Additional bibliography: Hocking, Excerpt. Bot. A9: 367. 1965; Moldenke, Phytologia 11: 483--484. 1965.

Recent collectors have found this plant in flower and fruit in February.

Additional citations: PERU: Junín: Hutchison & Tovar 4209 (Ac); Weberbauer 2582 [Macbride photos 17458] (W--photo of type).

VERBENA WEBERBAUERI Hayek

Additional bibliography: Hocking, Excerpt. Bot. A9: 367. 1965; Moldenke, Phytologia 11: 485. 1965.

Additional citations: PERU: Puno: Weberbauer 440 [Macbride photos 17459] (W--photo of type).

xVERBENA WINGEI Moldenke

Additional bibliography: Moldenke, Phytologia 11: 485--486. 1965; Hocking, Excerpt. Bot. A9: 367. 1965.

VERBENA WRIGHTII A. Gray

Additional bibliography: Hocking, Excerpt. Bot. A9: 367. 1965; Moldenke, Phytologia 11: 437, 440, 452, & 486--497. 1965.

In Nuevo León, Mexico, this plant has been found growing in calcareous marl, while Warnock says that it is "frequent" in limestone soil in Texas. Other recent collectors have found it along sandy rocky washes, in sandy gravel, on granite schist, and in dry sandy soil near creeks. The flowers on J. R. Crutchfield 107 & 319 are described as "pink", On Beasley & Finzel 805 they were "violet-pink" and on Crutchfield 63 "purple".

Additional citations: TEXAS: Brewster Co.: E. Marsh 247 (Au--214398); B. H. Warnock 20022 (Ld). El Paso Co.: Lundell & Lundell 16941 (Ld). Presidio Co.: B. H. Warnock 9004 (Mi). NEW MEXICO: Otero Co.: J. R. Crutchfield 63 (Ld). Socorro Co.: J. R. Crutchfield 107 (Ld). ARIZONA: Apache Co.: Deaver 5599 (Ac), 6483 (Ac). Gila Co.: Beasley & Finzel 805 (Ld). Navajo Co.: J. R. Crutchfield 319 (Ld). MEXICO: Nuevo León: May, Carrosco, Ibarra, & McCart 8902 (Au--232372).

VERBENA WRIGHTII f. ALBIFLORA Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A9: 367. 1965; Moldenke, Phytologia 11: 491 & 497--498. 1965.

VERBENA XUTHA Lehm.

Emended synonymy: Verbena matthesii Turcz., Bull. Soc. Nat. Mosc. 36 (2): 196--197. 1863.

Additional and emended bibliography: Turcz., Bull. Soc. Nat. Mosc. 36 (2): 196--197. 1863; Hocking, Excerpt. Bot. A9: 367. 1965; Moldenke, Phytologia 11: 446 & 498--507. 1965.

Turczanonow (1863) describes his V. matthesii as follows: "V. caule fruticoso tetragono, paniculato-ramoso, pilis adpressis aut subpatentibus scabro, ramis ramulisque oppositis, apice 1--3-stachyis; spicis inferne laxis, superne densifloris filiformibus elongatis; foliis basi breviter cuneata sessilibus oblongis acutis inciso-serratis; serraturis subfalcatis acuminatis, interioribus intertum bifidis aut denticulo auctis, utrinque pubescentibus; bracteis lanceolato-subulatis calyce pubescente brevioribus; tubo corollae calycem parum excedente; nuculis transverse rugosis. Ad V. menthaefoliam Bth., e hujus descriptione, videtur accedere; at bracteae non parvae, sed calyce paulo breviores, corolla calyce paulo nec triplo major."

Additional citations: TEXAS: Brazos Co.: Demaree 50859 (Ac). Fayette Co.: Matthes 13 [Macbride photos 34343] (W--photo). Galveston Co.: R. L. Crockett 8462 (Ld).

ADDITIONAL NOTES ON THE GENUS CITHAREXYLUM. II

Harold N. Moldenke

CITHAREXYLUM B. Juss.

Additional & emended synonymy: Citharexylum L. apud A. L. Juss., Gen. Pl., ed. 1, 108. 1789. Citharaexylum L. apud L. C. Rich., Act. Soc. Hist. Nat. Paris 1: 111. 1792. Citharexilum L. apud M. Kunz, Anatom. Untersuch. Verb. 70, sphalm. 1911. Citharexilon Harvey ex Moldenke, Alph. List Invalid Names Suppl. 1: 4, in syn. 1947; Soukup, Biota 4: 260. 1963. Hadongia Gagnep. in Humbert, Not. Syst. 14: 30. 1950. Catharexylum Greenm. ex Moldenke, Résumé Suppl. 3: 30, in syn. 1962. Cithaerexylon Barkley ex Moldenke, Résumé Suppl. 3: 30, in syn. 1962. Citharaxilium Moldenke, Résumé Suppl. 13: 6, in syn. 1966. Citharaxylum Moldenke, Résumé Suppl. 13: 6, in syn. 1966.

Additional & emended bibliography: A. L. Juss., Gen. Pl., ed. 1, 108 (1789) and ed. 2, 121--122. 1791; L. C. Rich., Act. Soc. Hist. Nat. Paris 1: 111. 1792; A. Gray, Syn. Fl. N. Am. 2 (1): 333 & 340. 1878; Solered., Bull. Herb. Boiss., sér. 1, 6: 628. 1898; K. Schum. in Just, Bot. Jahresber. 28 (1): 495. 1902; M. Kunz, Anatom. Untersuch. Verb. 69--70 & 78, fig. 8. 1911; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1235, 1237, & 1252. 1924; Britton & P. Wils., Scient. Surv. Porto Rico 6: 137 & 144--146. 1925; Patermann, Beitr. Zytol. Verbenac. 17 & 29. 1935; H. B. Davis, Life & Works Pringle 72, 76, 87, 153, 158, 214, 217, 668, & 669. 1936; M. Martínez, Cat. Nomb. Vulg. & Cientif. Pl. Mex., [ed. 2], 339. 1937; Troncoso, Darwiniana 3: 50, 51, & 56. 1937; Robledo, Lecc. Bot. 2: 497 & 498. 1940; Neal, In Gard. Hawaii 635, 639, & 640. 1948; Gagnep. in Humbert, Not. Syst. 14: 30. 1950; Reitz, Anais Bot. 2: 28 & 37. 1950; Moldenke, Biol. Abstr. 27: 2026 & 3121. 1953; E. J. Salisb., Ind. Kew. Suppl. 11: 55 & 106. 1953; E. L. Little, U. S. Dept. Agr. Forest Serv. Agric. Handb. 41: 110--111 & 450. 1953; Aristeguieta, Clava & Descrip. Fam. Arb. Venez. 192, 193, 256, 258, 270, & 284. 1954; Moldenke, Verb. 19--20. 1955; Angely, Fl. Paran. 7: 4, 6, & 11. 1957; Moldenke, Biol. Anstr. 32: 2353. 1958; Moldenke, Phytologia 6: 242--256, 262--320, 332--368, & 383--432 (1958), 6: 448--505 (1959), and 7: 7--77. 1959; Reitz, Sellowia 11: 77 & 97. 1959; Moldenke, Biol. Abstr. 33: 1862 (1959), 34: 481 (1959), and 35: 1464--1465 & 1689. 1960; Angely, Liv. Gen. Bot. Bras. 35 & 41. 1960; Angely, Fl. Paran. 15: 12 & 24. 1960; Soukup, Biota 3: 30. 1960; Muñoz Pizarro, Espec. Plant. Descr. Philippi 109. 1960; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Ind. 1959: 53. 1960; Troncoso, Darwiniana 12: 260. 1961; Moldenke, Biol. Abstr. 36: 4036 (1961) and 37: 1062. 1962; Angely, Fl. Bahia Paran. 22: 39. 1962; Soukup, Biota 4: 172, 189, & 192. 1962; Menninger, Flow. Trees World 325 & 327. 1962; Moldenke, Résumé Suppl. 3: 30. 1962; Hocking, Excerpt. Bot. A5: 43--45 (1962) and A6: 532. 1963; Shelford, Ecol. N. Am. 475, 490, & 557. 1963; T. Mey., Op. Lill. 10:

50. 1963; Soukup, Biota 4: 260 & 312 (1963) and 5: 35, 37, 117, 123, & 128. 1964; Moldenke in Shreve & Wiggins, Veg. & Fl. Son. Des. 2: 1259. 1964; Little & Wadsworth, U. S. Dept. Agr. Forest Serv. Agric. Handb. 249: 478—479, fig. 226. 1964; Menninger, Seaside Pl. 193 & 289. 1964; Langman, Select. Guide Lit. Flow. Pl. Mex. 160, 249, 335, 515—517, 633, 715, & 1010. 1964; Angely, Bibl. Veg. Paran. 128 & 195. 1964; Moldenke, Résumé Suppl. 10: 5 (1964), 11: 5 & 6 (1964), and 12: 3 & 9. 1965; Moldenke, Phytologia 12: 6, 21, & 27. 1965; Gooding, Loveless, & Proctor, Fl. Barbados 354, 356, & 468—469. 1965; Neal, In Gard. Hawaii, new rev. ed., 720, 721, & 726. 1965; Rambo, Pesquis. Bot. 21: 14—16 & [59]. 1965; Moldenke, Résumé Suppl. 13: 1, 2, & 6. 1966.

Little & Wadsworth (1964) note that "The generic name (Citharexylum) is Greek for fiddlewood. The English name fiddlewood and similar ones in French and Spanish for related species refer to the use for violins, guitars, and other musical instruments. The Spanish name péndula, meaning pendent, describes the long slender drooping or hanging clusters of flowers and fruits."

Aristeguieta (1954) records the common and vernacular names "ciudadito", "palo guitarro", "pendare", "péndula", "totumilla", "totumillo", and "totumillo blanco", while Soukup (1962, 1963, 1964) records "choloquillo cimarrón", "mullahuayo", "quiniellia blanco" [with a question], "tasta", "tosta", and "turucassa" — of these, "tasta" and "tosta" are applied also to Escallonia, while "turucassa" is applied also to Porlieria and Rauwolfia.

It should be noted here that Hadongia Gagnep. was originally proposed by Gagnepain as a genus in the Bignoniaceae. The H. Pittier 9967, originally distributed to herbaria as a species of Citharexylum, is actually Guettarda discolor Rusby in the Rubiaceae.

Any abbreviations used on the following pages of this paper for the names of herbaria in which cited specimens are deposited, and not accounted for in Phytologia 5: 154—159 (1955) and 6: 242 (1958), will be found explained in the introduction to my paper entitled "Materials toward a monograph of the genus Callicarpa. I" which follows the present one in the present journal.

CITHAREXYLUM AFFINE D. Don

Additional & emended bibliography: Sessé & Moc., Pl. Nou. Hisp., ed. 2, 96, pl. 417. 1893; M. Kunz, Anatom. Untersuch. Verb. 69—70 & 78, fig. 8. 1911; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1238 & 1241. 1924; H. B. Davis, Life & Works Pringle 158. 1936; Moldenke, Phytologia 6: 278—282. 1958; Hocking, Excerpt. Bot. A5: 43. 1962.

Illustrations: Sessé & Moc., Pl. Nou. Hisp., ed. 2, pl. 417. 1893; M. Kunz, Anatom. Untersuch. Verb. fig. 8. 1911.

Concerning the plate 417 in Sessé & Mocino's work (1893) Dr. Rogers McVaugh, in a letter to me dated October 11, 1963, says "Inclosed are two photographs that I took in Madrid this summer, of original plates made in Mexico probably in 1791, by the artists of the Royal Botanical Expedition.....plate 417 of the Plantae No-

vae Hispaniae (cited on p. 96, ed. 2), with type-locality Patzcuaro and/or Coahuayana. This is presumably the same species as C. sessei D. Don, of which I saw a specimen at Oxford this summer." As yet I have not been able to examine the Oxford specimen referred to here. My letter to Oxford offering to annotate the material of this group in the herbarium there has not been answered.

Recent collectors describe C. affine as a tree or as tree-like, 5--10 m. tall; trunk 20--25 cm. in diameter at breast height; corolla lavender or pale-lavender to deep-blue or purple, pale-hairy at the orifice; fruit orange-brown when immature, blue-black when mature. The species has been found growing on moist shaded slopes, oak-dominated slopes facing the Pacific, deciduous forests above the Orbignya palm zone, sandy loam in full exposure to the sun, wooded slopes and barrancas, oak woodland over dissected volcanic terrain, and variable woodland more or less marginal to tropical savannas. Gentry & Gilly comment "fruit turning pale-orange" or "turning orange-red and finally blue-black when mature"! The corolla is described as "purple" on Alava & Cook 1484 and Mc Vaugh 14898, "lavender" on McVaugh 15697, "pale-lavender" on Gentry & Gilly 10705, "violet" on Wilbur 2121, and "deep-blue" on Gentry & Gilly 10826. Alava & Cook describe the fruits as "berries", but they are actually drupes. The plant has been found in flower also in the month of March.

An isotype, Andrieux 135, in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva was photographed there by Macbride as his type photograph number 7877.

The Gentry, Barclay, & Arguelles 20252, distributed as C. affine, is actually C. gleasoniamum Moldenke.

Additional citations: MEXICO: Colima: R. McVaugh 15697 (Mi). Jalisco: Wilbur 2121 (Mi). México: Andrieux 135 [Macbride photos 7877] (N--photo of isotype); Hinton 9011 (Rf). Nayarit: Feddema 718 (Mi); Gentry & Gilly 10705 (Rf), 10826 (Rf); R. McVaugh 14898 (Mi); Paray 2687 (Ip). Sinaloa: Alava & Cook 1484 (Mi); J. Gonzalez Ortega 5430 (Ip).

CITHAREXYLUM ALTAMIRANUM Greenm.

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1237 & 1238. 1924; Moldenke, Phytologia 6: 284--286. 1958.

Recent collectors describe this plant as a slender shrub, to 12 feet tall, with white flowers, blooming in July, growing in thickets at altitudes of 1400 to 1600 meters, fruiting also in September.

Additional citations: MEXICO: Hidalgo: C. L. Lundell 12558 (Rf); Moore & Wood 3845 (Ba). Querétaro: Paray 2169 (Ip).

CITHAREXYLUM AMAZONICUM Moldenke

Additional bibliography: Moldenke, Phytologia 6: 286--287. 1958.

An isotype, Spruce 2114, deposited in the herbarium of the Naturhistorisches Museum in Vienna, was photographed there by Macbride as his type photograph number 34318.

Additional citations: BRAZIL: Amazonas: Spruce 2114 [Macbride photos 34318] (W--photo of isotype).

CITHAREXYLUM AMBIGUUM Moldenke

Additional bibliography: Moldenke, Phytologia 6: 287--288. 1958; Langman, Select. Guide Lit. Flow. Pl. Mex. 515. 1964.

CITHAREXYLUM ANDINUM Moldenke

Additional bibliography: Moldenke, Phytologia 6: 288--289 (1958) and 7: 73. 1959.

Steinbach describes this plant as a shrub, 1--2 m. tall, with white (no. 6019) flowers, growing at 2000 meters altitude, blooming in October and December.

Additional citations: BOLIVIA: Cochabamba: Steinbach 6019 (A). La Paz: Mandon 1493 [Macbride photos 28393] (W--1618705--isotype). Santa Cruz: Steinbach 8572 (G).

CITHAREXYLUM ARGUTEDENTATUM Moldenke

Additional synonymy: Citharexylum argutidentatum Moldenke, Résumé Suppl. 13: 6, in syn. 1966.

Additional bibliography: Moldenke, Phytologia 6: 289--290. 1958; Soukup, Biota 4: 172. 1962; Moldenke, Résumé Suppl. 13: 6. 1966.

Vargas Calderon found this species growing at 3000 to 3650 meters altitude, blooming in January and February. The Cárdenas 5464, distributed as C. argutedentatum, is actually C. punctatum Greenm.

Additional citations: PERU: Cuzco: Vargas Calderon 2407 (W—1995350), 7684 (W—1987877).

CITHAREXYLUM BERLANDIERI B. L. Robinson

Additional bibliography: M. Kunz, Anatom. Untersuch. Verb. 70. 1911; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1238--1240. 1924; H. B. Davis, Life & Works Pringle 76 & 87. 1936; M. Martínez, Cat. Nomb. Vulg. & Cientif. Pl. Mex., [ed. 2], 339. 1937; E. L. Little, U. S. Dept. Agr. Forest Serv. Agric. Handb. 41: 111. 1953; Moldenke, Phytologia 6: 290—294. 1958; Moldenke, Résume Suppl. 13: 1. 1966.

Additional vernacular names recorded for this plant are "encorba gallina" and "orcajuela". The plant has been found by recent collectors in tropical forests, deciduous tropical woods, secondary matorral, dry areas, and heavy black clay soil, in patches of brush with much mesquite, on shrub-grass basaltic mesas, clay dunes, and brushy caliche mesa slopes, in the timber belt on the leeward side of clay dunes, in palm groves, on low ridges, among brush on soil derived from basic igneous (basalt) rock near arroyos, in badly disturbed brush on black clay soil

derived from basalt, and in soft shale at the mouths of canyons, flowering in September and October. Kenoyer & Crum call the species a "forest tree", but Correll refers to it as a "climbing shrub" and Gentry a "slender shrub". The corollas on C. L. Lundell 10715 are described as "white", and the fruit on Correll & Johnston 19774 as "orange-red". Rzedowski found the plant growing at 1350 meters altitude in San Luis Potosí. Crutchfield & Johnston call it "abundant" in Tamaulipas, but Graham & Johnston refer to it as "infrequent in the brush" there.

Additional citations: TEXAS: Cameron Co.: D. S. Correll 14866 (Rf); Cory 51396 (Ca—754839, Du—345341); G. L. Fisher s.n. [Brownsville, Aug. 9, 1941] (S); C. L. Lundell 10715 (Rf, Rf); Lundell & Lundell 8668 (Du—320525); Tharp, Gimbrede, & Johnson 52-524 (St). MEXICO: Nuevo León: Correll & Johnston 19774 (Rf); Kenoyer & Crum 3260 (Mi). San Luis Potosí: Kenoyer s.n. [Valles, 8-39] (Mi); J. Rzedowski 8318 (Ip), 8637 (Ip), 10370 (Ip, Mi), 14770 (Ip). Sinaloa: Nápoles 10 (Ip). Tamaulipas: Crutchfield & Johnston 5699 (Mi); H. S. Gentry 6701 (Ca—946182, Du—356150); Gonzalez Medrano 5 (Ip); Graham & Johnston 4081 (Mi), 4398 (Mi), 4404 (Mi); Kenoyer & Crum 3365 (Mi); Manning & Manning 53385 (Ip); J. Rozynski 601 (Mi).

CITHAREXYLUM BOURGEAULANUM Greenm.

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1238 & 1240. 1924; Moldenke, Phytologia 6: 294—295. 1958.

CITHAREXYLUM BRACHYANTHUM (A. Gray) A. Gray

Additional & emended synonymy: Citharexylum brachyanthum Gray ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941. Citharexylum brachyanyhum Gray ex Moldenke, Phytologia 6: 295, in syn. sphalm. 1958.

Additional bibliography: M. Kunz, Anatom. Untersuch. Verb. 70. 1911; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1237 & 1238. 1924; H. B. Davis, Life & Works Pringle 87. 1936; Moldenke, Phytologia 7: 73—74. 1959; Moldenke, Résumé Suppl. 13: 6. 1966.

Recent collectors describe this plant as a bush or shrub, 2—7 feet tall, mostly divaricately branched, with bright-red or scarlet fruit, 6 mm. in diameter, fruiting in October and November. The Lundells refer to the fruits as "berries", but they are actually drupes. The flowers are described as "white" on C. H. Muller 3006. The plant has been found growing on limestone slopes and on thin limestone soil, in matorral vegetation, in alluvial ground with Larrea, and in association with Agave lechegu-illa and grasses. The leaves on M. T. Edwards 292 are extra large and spatulate. Muller refers to the species as "common" on Larrea-Flourensia flats and lower shrubby slopes, but "rare" in fine-soiled sinks on deserts and in open thickets of Rhus microphylla on Larrea-Flourensia deserts in Chihuahua. He calls it

"common in Larrea-Flourensia desert", but "infrequent in desert scrub on protruding basalt dikes" in Coahuila. Crutchfield & Johnston refer to it as "infrequent in desert scrub on limestone hillsides."

Additional citations: TEXAS: Zapata Co.: Lundell & Lundell 12664 (Rf). MEXICO: Chihuahua: C. H. Muller 3333 (Ca—721504, Mi, Rf). Coahuila: Crutchfield & Johnston 5871 (Rf); I. M. Johnston 7048 (Ca—741264); M. C. Johnston 5871 (Mi); C. H. Muller 3006 (Ca—719561, Mi, Rf), 3033 (Mi, Rf); Salgado s.n. [18.I. 1961] (Ip); Wynd & Mueller 9 (Mi, St). Durango: Correll & Johnston 20217 (Rf). Nuevo León: M. T. Edwards 292 (Ca—732106); Pringle 11818 (Gg—421298, Mi). San Luis Potosí: Crutchfield & Johnston 5656 (Mi); C. L. Lundell 5344 (Ca—602605); J. Rzedowski 5608 (Ip), 7636 (Ip). Zacatecas: Hernández Xolocotzi 592 (Rf); J. Rzedowski 9323 (Ip, Ip); Shreve 8590 (Ca—731757), 9203 (Ca—731694).

CITHAREXYLUM CAUDATUM L.

Additional synonymy: Citharaexylum caudatum L. apud L. C. Rich, Act. Soc. Hist. Nat. Paris 1: 111. 1792. Cytharexylon caudatum L. apud Macfadyen in Hook., Bot. Misc. 2: 115. 1831. Citharexilum caudatum L. apud M. Kunz, Anatom. Untersuch. Verb. 70, sphalm. 1911.

Additional & emended bibliography: L. C. Rich., Act. Soc. Hist. Nat. Paris 1: 111. 1792; Macfadyen in Hook., Bot. Misc. 2: 115. 1831; Hayek in Engl., Bot. Jahrb. 42: 170. 1908; M. Kunz, Anatom. Untersuch. Verb. 70. 1911; Britton & P. Wils., Scient. Surv. Porto Rico 6: 144—145. 1925; Robledo, Lecc. Bot. 2: 498. 1940; Neal, In Gard. Hawaii, [ed. 1], 640. 1948; Moldenke, Phytologia 7: 74. 1959; Shelford, Ecol. N. Am. 490. 1963; Little & Wadsworth, U. S. Dept. Agr. Forest Serv. Agric. Handb. 249: 478—479, fig. 226. 1964; Moldenke, Résumé Suppl. 11: 6. 1964; Neal, In Gard. Hawaii, new rev. ed., 726. 1965; Moldenke, Résumé Suppl. 13: 6. 1966.

Additional illustrations: Little & Wadsworth, U. S. Dept. Agr. Forest Serv. Agric. Handb. 249: fig. 226. 1964.

Recent collectors describe this plant as having a trunk to 25 cm. in diameter at breast height. The fruit is described by Bartlett & Lasser as "orange, turning purple". Allen refers to the species as a "common shrub" in Panama, while Erlanson found it "occasional along shores" on San José Island. H. H. Bartlett 17363, from Haiti, is not at all typical -- its leaf-blades are too pointed, small, and the venation is too much impressed above and prominent beneath; it may well be the hybrid xC. jamaicense Moldenke. Steyermark 38920, from Guatemala, does not appear to be typical either -- the collector describes its leaves as "rich-green above with orange-brown midrib, pale-green beneath with light-brown midrib, fruit spray pendent, fruit shiny". P. H. Allen 3597, from Panama, has very broad leaves. Bancroft & Miller 3 has wood section samples mounted on the herbarium sheet.

Material of C. caudatum has been misidentified and distributed in herbaria as C. ilicifolium H.B.K., C. schottii Greenm., C. spinosum L., Byrsonima crassifolia (L.) H.B.K., and Picramnia antidesma Sw. On the other hand, the Shank & Molina R. 4270, distributed as Citharexylum caudatum, is actually C. hexangulare Greenm.

Little & Wadsworth (1964) describe C. caudatum, as it grows in Puerto Rico, as follows: "Shrub or tree of upper montane forests characterized by: (1) opposite elliptic leaves blunt or rounded at apex and short-pointed at base, with few lateral veins; (2) narrow clusters of small white flowers 5/16 inch across the slightly unequal spreading corolla lobes and borne on short stalks 1/16 inch long; and (3) shiny pear-shaped or elliptic fruits nearly 1/2 inch long, turning from green to orange brown or black, with cup-like calyx at base.

"This species differs from its widely distributed close relative péndula (Citharexylum fruticosum L.) in the leaves coarsely veined without a prominent network of small veins when dry, in the flowers definitely stalked instead of almost stalkless, and in its distribution in mountain forests at higher elevations.

"A small slender evergreen tree 15--30 feet high and to 8 inches in trunk diameter, or a shrub. The bark is smoothish and brown, inner bark light brown and bitter. The long narrow twigs are light gray brown, with prominent raised leaf scars.

"Petioles are 1/4--3/4 inch long. Blades are 2--5 inches long and 3/4--2 1/4 inches wide, slightly thickened and with edges sometimes turned under a little, slightly shiny green above and dull and paler beneath. On the lower surface are many minute inconspicuous dots visible with a lens.

"Flower clusters (racemes) are 1 1/2--3 inches long, terminal and lateral, bearing many slightly fragrant flowers. The bell-shaped calyx is about 1/8 inch long and broad, minutely 5-toothed; the white finely hairy corolla with tube nearly 1/4 inch long and 5 lobes 1/8 inch long; 4 stamens nearly 1/8 inch long inserted on corolla tube; and greenish pistil 3/16 inch long with 2-celled ovary, slender style, and slightly 2-lobed stigma.

"The fleshy fruits (drupes) slightly 2-lobed have cuplike calyx 1/8 inch long remaining at base. They contain 2 elliptic shiny brown nutlets 3/8 inch long, each 1-seeded. Flowering and fruiting throughout the year.

"The light brown, hard wood is used for posts and fuel. Also a honey plant.

"Upper mountain forests and dwarf forests of mountain peaks in Puerto Rico."

They record the additional common names "café cimarrón", "café marron", "fiddlewood", "péndula de sierra", and "racemose fiddlewood".

Additional citations: MEXICO: Chiapas: Matuda 3771 (Mi, Rf), 3776 (Mi). Tabasco: Matuda 3066 (Mi). GUATEMALA: Izabal: Steyermark 38920 (W—1949548). BRITISH HONDURAS: Gentle 4793 (Ld, S),

8079 (Ld), 8488 (Ld, S). PANAMA: Canal Zone: P. H. Allen 1836 (Mi); Bartlett & Lasser 16308 (Mi), 16314 (Mi). Colón: P. H. Allen 3597 (Ca—790799, W—1976267). Panamá: Duke 4598 (Ca), 4599 (Ca). PEARL ISLANDS: San José: C. O. Erlanson 23 (Du—349976, Mi), 310 (Mi, N); Harlow 5 (W—2398301); I. M. Johnston 228 (W—2024005). CUBA: Las Villas: R. A. Howard 5204 (Ca—913758); León & Jack 13954 (W—2289443). Oriente: Linden 1789 (P); C. Wright 435 [1860] (Ca—936807). JAMAICA: Bancroft & Miller 3 (W—1555633); Harris & Lawrence C.15508A (Ca—984476); Proctor & Stearn 11449 (W—2351899); Wolle s.n. (Tl). HISPANIOLA: Haiti: H. H. Bartlett 17363 (Mi). PUERTO RICO: Alain 10350 (G, Ij, N, Sj), 10733 (G, N, N); Webster & Miller 8713 (S). POLYNESIA: HAWAIIAN ISLANDS: Oahu: A. R. Cooke s.n. [Manoa trail, 9/26/54] (St); Pearsall s.n. [Pauoa Flats, Aug. 1, 1953] (Bi). CULTIVATED: Hawaiian Islands: Caum s.n. [June 5, 1938] (Bi); Degener & Murashige 20075 (W—1991209); F. E. Egler 37-90 (Bi); Potter & Miyashiro s.n. [11/26/57] (Bi). Peru: Klug 355 (P); Martinet 693 (P), 852 (P), s.n. (P, P, P).

CITHAREXYLUM CHARTACEUM Moldenke

Additional bibliography: Moldenke, Phytologia 6: 310—312. 1958.

Ellenberg found this plant growing in a rainforest at 580 meters altitude, but misidentified it as C. quitense Spreng.

Additional citations: PERU: Province undetermined: Ellenberg 1489 [Huasimo nördl. Suyo] (Ut—163209b).

CITHAREXYLUM DAWEI Moldenke

Additional bibliography: Moldenke, Phytologia 6: 317—319. 1958.

Lasser & Foldats describe this plant as a tree 5 m. tall, with "frutas maduros, drupas, morado oscuro", fruiting in February. Material has been misidentified and distributed in herbaria as C. decorum Moldenke. On the other hand, the Aristeguieta 793, distributed as "Citharexylum cf. dawei Moldenke", is actually C. subthyrsoideum Pittier.

Additional citations: VENEZUELA: Falcón: Lasser & Foldats 3087 (Ve—36553).

CITHAREXYLUM DECORUM Moldenke

Additional bibliography: Moldenke, Phytologia 7: 74. 1959.

Brito describes this plant as a tree, 12 m. tall, free of branches for 9 m., flowering in June, and called "pauji". The Bernardi 6739, cited by me in the reference given above, proves, on closer examination, to be C. poeppigii Walp. Similarly, the Lasser & Foldats 3087, distributed as C. decorum, is actually C. dawei Moldenke, while Steyermark 86556 is C. fruticosum var.

brittonii Moldenke.

Additional citations: VENEZUELA: Vargas: Brito 4 (Ve).

CITHAREXYLUM DENTATUM D. Don

Additional bibliography: Moldenke, Phytologia 6: 332—333. 1958; Hocking, Excerpt. Bot. A5: 43. 1962.

An isotype, Ruíz s.n., deposited in the herbarium of the Botanisches Museum at Berlin, was photographed there by Macbride as his type photograph number 17592, but is now most unfortunately destroyed.

Additional citations: PERU: Ancash: Ruíz s.n. [Maccos; Macbride photos 17592] (W—photo of isotype).

CITHAREXYLUM DISCOLOR Turcz.

Additional synonymy: Citharexylum discolor Urb. & Ekm. ex Moldenke, Résumé Suppl. 10: 5, in syn. 1964.

Additional bibliography: Moldenke, Phytologia 6: 334—336. 1958; Moldenke, Résumé Suppl. 10: 5. 1964.

Recent collectors describe this plant as a shrub, 3—5 m. tall, or a small tree, to 6.5 m. tall, with white flowers and green fruit, growing from 630 to 1700 meters altitude, flowering in May, and fruiting in August.

Additional citations: HISPANIOLA: Dominican Republic: R. A. Howard 12285 (Mi, N, S), 12304 (Mi); Jiménez 4002 (W—2350401). Haiti: Leonard & Leonard 15066 (W—1453385, W—1453386).

CITHAREXYLUM DONNELL-SMITHII Greenm.

Additional synonymy: Catharexylum donnell-smithii Greenm. ex Moldenke, Résumé Suppl. 3: 30, in syn. 1962.

Additional bibliography: Moldenke, Phytologia 7: 74. 1959; Moldenke, Résumé Suppl. 3: 30. 1962.

Recent collectors describe this plant as a tree, 20—60 feet tall; trunk erect, to 40 cm. wide at the base, 36.5 cm. wide at breast height; bark dark-gray or dark gray-brown, shaggy; leaves membranous, slightly thickened and stiffened, dark opaque-green, glabrous, with the slender venation light yellow-green, pale beneath; flowers trumpet-form, white, fragrant, 5—6 mm. in diameter, the lobes expanding; heavily fruited, the mature fruit orange, subglobular, greatly favored by wild pigeons, growing in clay-loam soil along open roadsides in the upper limit of the tropical zone or in gray loam of pastures, at altitudes of 2400 to 6600 feet, flowering in January, fruiting in February and April, known as "chorrito". The Standley & Padilla V.2664, cited in Phytologia 7: 74 (1959) as from Sonsonate, is actually from Ahuachapán, El Salvador. The Stork 3283, distributed as C. donnell-smithii, is actually C. macradenium Greenm.

Additional citations: MEXICO: Chiapas: E. J. Alexander 1217 (N, N, N, Z). GUATEMALA: Sacatepéquez: P. C. Standley 64953 (Mi). EL SALVADOR: La Libertad: M. C. Carlson 228 (Ca—703661). Santa Ana: Allen & Armour 6798 (Mi). COSTA RICA: Alajuela: A. Smith P.2337

(Ca—12726); A. F. Smith 26 [Stork 4126] (Ld, Mi). San José: Tonduz 1419 (G).

CITHAREXYLUM DRYANDERAE Moldenke

Additional bibliography: Moldenke, Phytologia 6: 340—341. 1958.

Additional citations: COLOMBIA: Valle del Cauca: Dryander 2362 (Bm—isotype).

CITHAREXYLUM ELLIPTICUM Sessé & Moc.

Additional bibliography: M. Kunz, Anatom. Untersuch. Verb. 71. 1911; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1238 & 1240. 1924; Moldenke, Phytologia 6: 342—345. 1958.

Recent collectors describe this plant as a shrub or low shrub, 1—3 m. tall, with white flowers and orange or orange-red fruit, growing in loam or sandy soil, with full exposure to the sun, in front of large active dunes at the back of storm-beaches, and on stabilized sand-dunes along beaches, flowering and fruiting in December. King refers to it as "common" or "locally abundant" in Vera Cruz, Mexico. León found it growing along roadsides in Cuba.

Additional citations: MEXICO: Vera Cruz: R. M. King 1093 (Mi), 1143 (Mi), 2706 (N, Z); Paray 1938 (Ip), 2869 (Ip); Paxson, Webster, & Barkley 17M620 (Au—123187, Au—169676); Sauer & Gade 3110 (Mi). CUBA: Matanzas: León 13905 (W—2289442).

CITHAREXYLUM FLABELLIFOLIUM S. Wats.

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1237 & 1239. 1924; Moldenke, Phytologia 7: 74. 1959; Moldenke in Shreve & Wiggins, Veg. & Fl. Son. Des. 2: 1259. 1964.

Recent collectors describe this plant as a shrub or stiff shrub, 1.3—3 m. tall, as broad as tall, rather compact in the middle, but with widely ascending branches, growing at 950 feet altitude, fruiting in April. Thomas found it growing in association with the following dominants: Pachycereus pringlei (S. Wats.) Britton & Rose, Bursera spp., Jatropha spp., Fouquiera peninsularis Nash, Forchammeria watsoni Rose, and Machaericereus gummosus (Engelm.) Britton & Rose.

Additional citations: MEXICO: Baja California: J. H. Thomas 8421 (Du—419744). Sonora: H. S. Gentry 4721 (Mi); Shreve 6115 (Mi). MONSERRATE ISLAND: R. V. Moran 3886 (Ca—1444).

CITHAREXYLUM FLEXUOSUM (Ruíz & Pav.) D. Don

Additional synonymy: Citharexylon spinosum Humb. & Kunth ex Benth., Bot. Voy. Sulphur 154. 1846.

Additional bibliography: Benth., Bot. Voy. Sulphur 154. 1846; Moldenke, Phytologia 6: 349—353. 1958; Soukup, Biota 4: 172. 1962.

This species has been found growing at 400 meters altitude, fruiting in August. Soukup (1962) records the common name "choloquillo cimarron". An isotype of C. spinosum, Humboldt & Bon-

pland 3687, deposited in the herbarium of the Botanisches Museum at Berlin, was photographed there by Macbride as his type photograph number 17601, but is now destroyed. The type of Rauwolfia emarginata, Ruíz & Pavon 88, deposited in the Madrid herbarium, was photographed there by Macbride as his type photograph number 29685. The Soukup 4498, distributed as C. flexuosum, is actually Duranta skottsbergiana Moldenke.

Additional citations: PERU: Arequipa: Ellenberg 2691 (Ut--163206b); Rose & Rose 18988 (W--761572). Cajamarca: Humboldt & Bonpland 3687 [Herb. U. S. Nat. Arb. 196719; Macbride photos 17601] (W--photo). Huámuco: Ruíz & Pavon 88 [7/78; Macbride photos 29685] (W--photo).

CITHAREXYLUM FRUTICOSUM L.

Additional synonymy: Citharoxylon fruticosum L. ex Moldenke, Résume Suppl. 3: 30. 1962.

Additional bibliography: Griseb., Cat. Pl. Cub. 216. 1866; M. Kunz, Anatom. Untersuch. Verb. 71. 1911; E. L. Little, U. S. Dept. Agr. Forest Serv. Agric. Handb. 41: 111. 1953; Moldenke, Verb. 20-21. 1955; Moldenke, Phytologia 7: 75. 1959; Jimenez, List Nom. Vernac. 9. 1961; Menninger, Flow. Trees World 292. 1962; Hocking, Excerpt. Bot. A5: 43. 1962; Shelford, Ecol. N. Am. 475 & 557. 1963; Menninger, Seaside Pl. 193. 1964; Little & Wadsworth, U. S. Dept. Agr. Forest Serv. Agric. Handb. 249: 480 & 481, fig. 227. 1964.

Additional illustrations: Little & Wadsworth, U. S. Dept. Agr. Forest Serv. Agric. Handb. 249: fig. 227. 1964.

Additional common names for this plant are "café cimarrón", "canilla de venado", "long-tom", "pasture fiddlewood", and "susanaleche". Material has often been misidentified and distributed in herbaria as C. spinosum L. Britton & Wilson (1925) reduce C. pentandrum Vent. to synonymy under C. fruticosum, calling it a juvenile form.

Recent collectors describe C. fruticosum as a spindly sparsely branched shrub, 1 m. tall, or a tree, 2.7--9 m. tall, the petioles orange-colored, the corollas white, and the fruit reddish-orange, inhabiting coastal limestone bluffs, and found at altitudes to 600 meters. On the sheet of Totten & Gifford s.n., cited below, there appears this statement: "Gifford says that this is the true fiddlewood. It does not agree with Small". There are a few hairs in the vein-axils of this specimen. Webster refers to the species as "uncommon" in Oriente, Cuba.

Little & Wadsworth (1964) describe the plant as follows: "This small tree is easily recognized by: (1) opposite, mostly elliptic, yellow-green leaves with conspicuous pink or orange petioles; (2) narrow clusters of small fragrant white flowers nearly 3/8 inch across the 5 slightly unequal spreading corolla lobes, borne almost stalkless on narrow drooping axes; (3) nearly round, shiny, reddish-brown or black fruits 3/8 inch or less in diameter; and (4) rough, light brown bark, becoming much fissured and shredding

in long narrow strips.

"Evergreen shrub or small slender tree 10--40 feet in height and to 1 foot in trunk diameter. The inner bark is whitish and tasteless. Young twigs are 4-angled and with faint rings at nodes, slender, light brown or green, becoming gray and finely fissured. Petioles are 1/2--1 inch long. Leaf blades are 3--7 inches long and 1--2 1/2 inches broad, short- or long-pointed at both ends or sometimes rounded or notched at apex, the edges rarely toothed on young shoots, thick and leathery, sometimes hairy on veins beneath, shiny yellow green on upper surface and dull beneath, turning red before falling. They vary greatly in shape from lance-shaped to elliptic or obovate and when dry show a raised network of small veins on both sides. The midrib often is pinkish toward base. Flower clusters (racemes) are 2--12 inches long, lateral and terminal, unbranched, bearing many white flowers about 3/8 inch long. The pale green calyx is narrowly tubular, 3/ 16 inch long, mostly 5-toothed, hairless or hairy; the white tubular 5-lobed corolla nearly 3/8 inch long, hairy at throat; 4 stamens inserted on corolla tube; and pistil with 4-celled green ovary, slender style, and slightly 2-lobed stigma. The drooping clusters of fleshy fruits (drupes), sometimes abundant, are reported to be sweet and edible. Each has a stone which separates into 2 2-seeded nutlets. Flowering and fruiting through the year.

"The sapwood is light brown and thin, and the heartwood is reddish. The wood is very hard, heavy (specific gravity 0.7), and strong. Considered a good fencepost in Puerto Rico. The wood of this and related species has been used elsewhere for furniture, construction, and violins, guitars, and other musical instruments.

"Sometimes planted along highways and fences and in gardens as an ornamental. Also a honey plant. This species is subject to attacks by caterpillars which fasten the leaves together in bundles and cause leaf fall, reducing the value for ornament.

"In thickets and forests of the coastal, limestone, and lower mountain regions of Puerto Rico. Also in Desecheo, Icacos, Culebra, Vieques, St. Croix, St. Thomas, St. John, Tortila, and Virgin Gorda."

The Britton & Shafer 249, Britton & Brace 233, and Fishlock 73 & 198, distributed as typical C. fruticosum, are actually all f. bahamense (Millsp.) Moldenke.

Additional citations: FLORIDA: Brevard Co.: Melvin s.n. [July 24, 1957] (Hi--184164). Dade Co.: Tidestrom 6956 (Ca--882450); Totten & Gifford s.n. [December 30, 1940] (Hi--22775). Big Pine Key: Killip 41449 (Tl). CUBA: Camagüey: Shafer 955 (Bi). Las Villas: A. Gonzales 671 (Mi); J. G. Jack 5514 (Du--347288); Morton 4488 (W--1782704). Matanzas: Morton 10224 (W--2350807). Oriente: López Figueiras 2952 (W--2228995); Morton & Alain 9194 (W--2285278); G. L. Webster 4071 (Mi). Province undetermined: Sagra 583 (P). JAMAICA: West & Arnold 910 (N). HISPANIOLA: Dominican

Republic: B. Augusto 1061 (N); Howard & Howard 9757 (B). PUERTO RICO: R. G. Finch 70 (Mi); A. A. Heller 4421 (P); Sintenis 720b (P), 1915 (P), 2085 (P). WINDWARD ISLANDS: Martinique: Herb. Mus. Paris s.n. (P). Ronde: R. A. Howard 10733 (N). St. Lucia: Webster & Miller 9356 (Mi). TOBAGO: Purseglove P.6363 (N, W—2429296). VENEZUELA: Sucre: Aristeguieta & Agostini 4769 (N). BRITISH GUIANA: E. L. Little 16710 (Z).

CITHAREXYLUM FRUTICOSUM f. BAHAMENSE (Millsp.) Moldenke

Synonymy: Citharexylon bahamense Millsp. in Britton, Bull. N. Y. Bot. Gard. 3: 450—451. 1905. Citharexylum bahamense Millsp. apud Prain, Ind. Kew. Suppl. 3: 43. 1908.

Bibliography: Britton, Bull. N. Y. Bot. Gard. 3: 450—451. 1905; Prain, Ind. Kew. Suppl. 3: 43. 1908; Moldenke, Prelim. Alph. List Invalid Names 15. 1940; Moldenke, Alph. List Invalid Names 13. 1942; Moldenke, Résumé 253 & 255. 1959; Moldenke, Phytologia 13: 242. 1966.

This narrow-leaved pubescent form of the species was hitherto regarded by me as var. villosum (Jacq.) O. E. Schulz, but I feel now that it is worthy of nomenclatural recognition. It seems to bear the same relation to var. villosum as does var. smallii Moldenke to the typical C. fruticosum L. Material has been misidentified and distributed in herbaria as C. fruticosum L. and as C. fruticosum var. villosum (Jacq.) O. E. Schulz.

The type of the form was collected by Nathaniel Lord Britton and Lewis Jones Knight Brace (no. 233) in a coppice on Farrington Road, New Providence, Bahama Islands, on August 24, 1904, and is deposited in the Britton Herbarium at the New York Botanical Garden. The form has been found growing in coppices, copses, and hillside thickets, on hills, and along roadsides, flowering in February, August, October, and November, fruiting in August and October.

Citations: BAHAMA ISLANDS: New Providence: Britton & Brace 233 (B—isotype, B—photo of type, F—171690—isotype, G—isotype, K-isotype, K—photo of type, N—type, N—photo of type, S—photo of type, Z—photo of type). VIRGIN ISLANDS: St. John: Britton & Shafer 249 (N, W—756261). Tortola: Fishlock 198 (A, G, K, N, W—1476732). Virgin Gorda: Fishlock 73 (N).

CITHAREXYLUM FRUTICOSUM var. BRITTONII Moldenke

Additional bibliography: Moldenke, Verb. 21. 1955; Moldenke, Phytologia 6: 366—368 (1958) and 13: 284—285. 1966.

In Trinidad this plant is said to be "widely distributed in southern districts, but never common. Endemic". Actually it is not endemic to Trinidad, occurring also in various parts of Venezuela. Cowan & Forster describe it as an "infrequent tree with pendent branches", growing at 100 meters altitude, flowering in March. Delgado calls it a shrub, 5 m. tall, while Steyermark refers to it as a tree, 10 m. tall, with subcoriaceous leaves, deep-

green above, paler-green beneath, the calyx and rachis pale-green, known as "totumillo sabañero" in Venezuela. Material has been misidentified and distributed in herbaria as C. decorum Moldenke and as C. spinosum L.

Additional citations: TRINIDAD: Cowan & Forster 1278 (N). VENEZUELA: Bolívar: Steyermark 86556 (Ve), 88236 (N), 88829 (N); Delgado 421 (Ve).

CITHAREXYLUM FRUTICOSUM var. SMALLII Moldenke

Additional bibliography: Moldenke, Phytologia 6: 368 & 383. 1958; Hocking, Excerpt. Bot. A5: 43. 1962.

CITHAREXYLUM FRUTICOSUM var. SUBSERRATUM (Sw.) Moldenke

Additional bibliography: Griseb., Cat. Pl. Cub. 216. 1866; Moldenke, Phytologia 6: 383--386. 1958.

Additional citations: HISPANIOLA: Dominican Republic: Vélez 3738 (W--1957415).

CITHAREXYLUM FRUTICOSUM var. SUBVILLOSUM Moldenke

Additional bibliography: Moldenke, Verb. 21--22. 1955; Moldenke, Phytologia 6: 386--388. 1958.

Additional citations: FLORIDA: Big Pine Key: Killip 40702 (Ca--933770). VIRGIN ISLANDS: St. Thomas: Eggers 90 (W--1959207); D. Hummel s.n. [1.II.1958] (Go, S).

CITHAREXYLUM FRUTICOSUM var. VILLOSUM (Jacq.) O. E. Schulz

Additional bibliography: Griseb., Cat. Pl. Cub. 216. 1866; A. Gray, Syn. Fl. N. Am. 2 (1): 340. 1878; Moldenke, Phytologia 7: 75 (1959) and 13: 289. 1966.

Recent collectors describe this plant as a small tree, to 15 or 20 feet tall, with white fragrant or very fragrant flowers, and "leaves shining white-pubescent below", inhabiting rocky hillslopes, rocky or rocky limestone hillsides, to 3000 feet altitude, flowering in July and September.

The very narrow-leaved form of this variety, represented by Millspaugh's C. bahamense, seems to me now to be worthy of nomenclatural recognition. Therefore, the Britton & Brace 233, Britton & Shafer 249, and Fishlock 73 & 198, cited by me in my monograph as var. villosum, are now regarded as f. bahamense (Millsp.) Moldenke instead -- the first-mentioned being the type collection.

The flowers on R. A. Howard 12068 are described as "white" and the leaves "shining white-pubescent below".

Additional citations: CUBA: Las Villas: R. A. Howard 4952 (Ca--913804, Mi); Howard, Briggs, Kamb, Lane, & Ritland 374 (Ca--998497, Mi, Rf, Tl). HISPANIOLA: Dominican Republic: R. A. Howard 12068 (Mi, N). Haiti: Holdridge 1428 (Mi); G. R. Proctor 10636 (W--2225297). CULTIVATED: Senegal: Adam 16950 (Mm).

CITHAREXYLUM FULGIDUM Moldenke

Additional bibliography: Moldenke, Phytologia 6: 394--395. 1958;

Langman, Select. Guide Lit. Flow. Pl. Mex. 515. 1964.

Moore describes this plant as a shrub, to 10 feet tall, with red to black fruit, found along roadsides in pine woods, at 2000 meters altitude, fruiting in October.

Additional citations: MEXICO: Hidalgo: H. E. Moore 5308 (Ca--918892).

CITHAREXYLUM GLABRUM (S. Wats.) Greenm.

Additional synonymy: Citharexylum glabrum Greenm. ex Moldenke, Résumé Suppl. 13: 6, in syn. 1966.

Additional bibliography: M. Kunz, Anatom. Untersuch. Verb. 71-72. 1911; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1238 & 1240. 1924; H. B. Davis, Life & Works Pringle 72, 668, & 669. 1936; Moldenke, Phytologia 6: 396--398. 1958; Moldenke, Résumé Suppl. 13: 1 & 6. 1966.

Diquet [whose surname is misspelled "Diguet" on some herbarium labels] records the vernacular name "chilcahua" for this plant. Paray found the species growing at 2000 meters altitude.

Additional citations: MEXICO: Guerrero: Hinton 14825 (Rf). Jalisco: Diquet s.n. [Decembre 1912, Huejotitan] (Mi). Nayarit: Paray 3395 (Ip, Mi).

CITHAREXYLUM GLAZIOVII Moldenke

Additional bibliography: Moldenke, Phytologia 6: 398--400. 1958.

Ducke describes the fruit of this species as "frutos maduros vermelhos", and collected it in fruit in February.

Additional citations: BRAZIL: Ceará: Ducke 2532 (W--2343742).

CITHAREXYLUM GLEASONIANUM Moldenke

Additional bibliography: Moldenke, Phytologia 6: 400--401. 1958; Langman, Select. Guide Lit. Flow. Pl. Mex. 515. 1964; Moldenke, Phytologia 13: 279. 1966.

Recent collectors have found this plant growing at 6500--7000 feet altitude, flowering in August, and describe it as a small tree or montane shrub, with white flowers, growing on limestone.

Additional citations: MEXICO: Puebla: Gentry, Barclay, & Arguelles 20252 (W--2451070); J. Rzedowski 18848 (Ip).

CITHAREXYLUM HERRERAE Mansf.

Additional bibliography: Moldenke, Phytologia 6: 401--403. 1958; Soukup, Biota 4: 172. 1962.

Soukup (1962) records the vernacular name "huairuro". An isotype, Herrera 677, deposited in the herbarium of the Botanisches Museum at Berlin, was photographed there by Macbride as his type photograph number 17595, but is now destroyed.

Additional citations: PERU: Cuzco: Herrera 677 [Macbride photos 17595] (W--photo of isotype).

CITHAREXYLUM HEXANGULARE Greenm.

Additional bibliography: M. Kunz, Anatom. Untersuch. Verb. 72.

1911; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1238 & 1241. 1924; Moldenke, Phytologia 6: 403—406 (1958) and 13: 283. 1966.

Recent collectors describe this species as a shrub, 4 m. tall, or a tree, 10 m. tall, with horizontal whorled branches, leaves firmly membranous, deep-green above, dull-green beneath, flowers white, very fragrant, and fruit red, growing on limestone rock along riversides, on steep mountainsides from the oak zone to that of the pines, and in Rhizophora forests, from 1 to 2250 meters altitude, flowering in July and November, fruiting in October and December. McVaugh describes it as "occasional along old roads" in Jalisco. Additional vernacular names are "frutillo" and "granadilla". Material has been misidentified and distributed in herbaria as C. caudatum L. and C. pterocladum Donn. Sm.

Additional citations: MEXICO: Campeche: Matuda 3861 (Mi). Chiapas: Gilly & Hernandez Xolocotzi 193 (Mi). Jalisco: R. Mc Vaugh 20632 (Mi). Oaxaca: J. V. Santos 3818 (Mi). Quintana Roo: Lundell & Lundell 7679 (Rf). Tabasco: Matuda 3562 (Mi). Vera Cruz: Dodds 110 (Mi); J. Rzedowski 17175 (Ip). GUATEMALA: El Petén: Contreras 1831 (Ld, S); Steyermark 45851 (W—1949698). BRITISH HONDURAS: Gentle 4858 (Ld). COSTA RICA: Limón: Shank & Molina R. 4270 (W—2085192).

CITHAREXYLUM HIDALGENSE Moldenke

Additional synonymy: Citharaxilium hidalgense Moldenke, Résumé Suppl. 13: 6, in syn. 1966. Citharaxylum hidalgense Moldenke, Résumé Suppl. 13: 6, in syn. 1966.

Additional bibliography: Moldenke, Phytologia 7: 75. 1959; Moldenke, Résumé Suppl. 13: 6. 1966.

The stems on Hinton 15606 are pubescent and the plant was in flower when collected; on C. L. Lundell 12642, collected while in fruit, the stems are glabrous. Moore found the plant growing on limestone ledges and in streamside thickets, at 1800—2000 meters altitude, and describes it as a tree to 20 feet tall, with white or lavender flowers, and red fruit, flowering and fruiting in April. Paray found it flowering in November.

Additional citations: MEXICO: Hidalgo: M. Martínez s.n. [Zacualtipán, May—June 1940] (G); H. E. Moore 2631 (Ca—919331); Pringle 8969 (Ut—28421a—isotype); Vela G. 589 (Ip). México: Paray 2264 (Ip). Michoacán: Hinton 15606 (Rf). Puebla: C. L. Lundell 12642 (Rf).

CITHAREXYLUM HINTONI Moldenke

Additional bibliography: Moldenke, Phytologia 6: 408—409. 1958; Langman, Select. Guide Lit. Flow. Pl. Mex. 515. 1964.

Additional citations: MEXICO: México: Hinton 7514 (Rf).

xCITHAREXYLUM HYBRIDUM Moldenke

Additional bibliography: Moldenke, Phytologia 6: 411. 1958.

Additional citations: TOBAGO: W. E. Broadway 4064 (P—isotype,

P—isotype).

CITHAREXYLUM ILICIFOLIUM H.B.K.

Additional bibliography: Schwencke, Zytol. Untersuch. Verbenac. 17 & 29. 1931; Patermann, Beitr. Zytol. Verbenac. 6 & 46. 1935; K. V. O. Dahlgren, Svensk. Bot. Tidsk. 32: 231. 1938; Soukup, Biota 1: 180. 1956; Moldenke, Phytologia 7: 75 (1959) and 13: 283. 1966.

Recent collectors describe this plant as a shrub or small tree, to over 5 m. tall, with white flowers, and dark cherry red-black fruit, growing at 2500 to 2850 meters altitude, flowering in November, fruiting in February and November. Ewan encountered it in cultivation by a lake. A specimen of Herb. Humboldt s.n. [Chillo], deposited in the herbarium of the Botanisches Museum at Berlin, was photographed there by Macbride as his type photograph number 17593, but is now destroyed. The Caum s.n. [June 5, 1938], distributed as C. ilicifolium, is actually C. caudatum L.

Additional citations: ECUADOR: Azuay: Gilar 6 (N). Pichincha: Barclay, Juajibioy, & Tinajero 7821 (Mi); Herb. Humboldt s.n. [Chillo; Macbride photos 17593] (W—photo of cotype); I. Holmgren 951 (Gg—354864). CULTIVATED: Ecuador: Ewan 16413 (N).

xCITHAREXYLUM JAMAICENSE Moldenke

Additional bibliography: Moldenke, Phytologia 6: 416—417 (1958) and 13: 282. 1966.

The H. H. Bartlett 17363, cited under C. caudatum L., is not at all typical of that species. Its leaves are too pointed and small, and the venation is too much impressed above and prominent beneath. It may well represent the present hybrid and therefore represent its first record from Haiti.

CITHAREXYLUM JÖRGENSENII (Lillo) Moldenke

Additional synonymy: Citharexylon jorgensenii (Lillo) Moldenke apud T. Mey., Op. Lill. 10: 126. 1963.

Additional bibliography: Moldenke, Phytologia 6: 417—418. 1958; T. Mey., Op. Lill. 10: 50 & 126. 1963; Moldenke, Résumé Suppl. 11: 6. 1964.

Meyer (1963) describes this species as a tree, 8—10 m. tall, with a trunk about "0,40 cm." in diameter, growing on mountainsides. He cites Venturi 3988 (Ml) from Tucumán, Argentina. A specimen of Schuel 197, deposited in the herbarium of the Naturhistorisches Museum at Vienna, was photographed there by Macbride as his type photograph number 34315.

Additional citations: ARGENTINA: Jujuy: Schuel 197 (W—photo). Tucumán: Jörgensen 47 (W—921654—isotype); Venturi 2961 (W—1591274).

CITHAREXYLUM JURGENSENI Briq.

Additional bibliography: Moldenke, Phytologia 6: 418—420. 1958; Langman, Select. Guide Lit. Flow. Pl. Mex. 160 & 1010. 1964.

McVaugh describes this plant as a tree, 10 m. tall, the trunk 15 cm. in diameter at breast height, the inflorescences drooping, calyx-tube red-lavender distally, and corolla blue-lavender, the throat white, the upper lobes with a marginal purple stripe proximally, scarce on barrancas, precipitous mountainsides in the region of moist tropical forests, with oak forests on the ridges and with Croton, Inga, and Sideroxylon in the barrancas, at altitudes of 800 to 1200 meters, flowering in September.

The type specimen, Jurgensen 259, deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, was photographed there by Macbride as his type photograph number 24623.

Additional citations: MEXICO: Nayarit: R. McVaugh 18920 (Mi). Oaxaca: Jurgensen 259 [Macbride photos 24623] (N—photo of type).

CITHAREXYLUM KARSTENI Moldenke

Additional synonymy: Citharexylon karsteni Moldenke, Résumé Suppl. 13: 6, in syn. 1966.

Additional bibliography: Moldenke, Phytologia 6: 420—422. 1958; Moldenke, Résumé Suppl. 13: 6. 1966.

An isotype, Triana 2071, deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, was photographed there by Macbride as his type photograph number 28395.

Additional citations: COLOMBIA: Cundinamarca: Triana 2071 [Macbride photos 28395] (W—photo of isotype).

CITHAREXYLUM KARSTENI var. LANCEOLATUM Moldenke

Additional synonymy: Citharexylon karsteni var. lanceolatum Moldenke, Résumé Suppl. 13: 6, in syn. 1966.

Additional bibliography: Moldenke, Phytologia 6: 422—423. 1958; Moldenke, Résumé Suppl. 13: 6. 1966.

Mason reports "fruit in pendulous racemes, first orange, later dark purple, 2-seeded, resembling Rhamnus" and found the plant growing on a dissected plateau (badlands).

Additional citations: COLOMBIA: Huila: H. L. Mason 13799 (Mi).

CITHAREXYLUM KERBERI Greenm.

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1237 & 1239. 1924; Moldenke, Phytologia 6: 423—424. 1958.

CITHAREXYLUM KOBUSKIANUM Moldenke

Additional bibliography: Moldenke, Phytologia 6: 424—425. 1958.

Lopez describes the corolla of this plant as white, and found the species along roadsides at 1750 meters altitude, flowering in June, and called "veneno de burro". Material has been misidentified and distributed in herbaria as Duranta mutisii L. f.

Additional citations: PERU: La Libertad: A. Lopez 1520 (Z); Vargas S. 39 (W—2253623).

CITHAREXYLUM KUNTHIANUM Moldenke

Additional bibliography: Moldenke, Phytologia 7: 75. 1959.

An isotype, Humboldt & Bonpland 5898, deposited in the herbarium of the Botanisches Museum at Berlin, was photographed there by Macbride as his type photograph number 17602, but is now destroyed. Material has been misidentified and distributed in herbaria as Cordia sp. and as Croton sp.

Additional citations: COLOMBIA: Cauca: Alston 8300 (S); Sneidern 2816 (W--2103916). Valle del Cauca: Humboldt & Bonpland 5898 [Herb. Willdenow 11476; Macbride photos 17602; Herb. U. S. Nat. Arb. 197895] (W--photo of isotype); Killip 11264 (G).

CITHAREXYLUM LAETUM Hiern

Additional bibliography: Angely, Fl. Paran. 7: 11. 1957; Moldenke, Phytologia 6: 429--432. 1958; Angely, Fl. Paran. 16: 45 (1960) and 17: 46. 1961; Angely, Bibl. Veg. Paran. 128. 1964.

CITHAREXYLUM LANKESTERI Moldenke

Additional bibliography: Moldenke, Phytologia 6: 432 (1958) and 6: 448. 1959; Moldenke, Biol. Abstr. 33: 1862. 1959.

Recent collectors describe this plant as a tree, 7.5--20 m. tall, the trunk erect, 50 cm. wide at the base or to 60 cm. wide at breast height, the bark light-brown, forming long elevated strips, the crown spreading, compact, the foliage subcoriaceous, semi-rigid, bright shiny-green and glabrous above, light-green and with a short tomentum beneath, the fruit subglobose, fleshy, slightly flattened laterally, red-russet or red and yellow, to 2 cm. in diameter, mostly clustered near the base of the pale buff-yellow peduncle, growing in gray clay-loam in forests on southern volcano slopes or on banks above stream on north-facing canyon side, at altitudes of 2100 to 2700 meters, flowering in March, and fruiting in February. In November, 1953, Steyermark noted on a sheet of Tucker 1049 "probably new species but flowers necessary for determination".

Additional citations: EL SALVADOR: Chalatenango: Tucker 1049 (Ca--887, Ca--888, Mi, Rf). COSTA RICA: Alajuela: A. Smith P.2397 (Ca--12715). Heredia: Skutch 5487 (W--2351973).

CITHAREXYLUM LAURIFOLIUM Hayek

Additional bibliography: Soukup, Biota 1: 180. 1956; Moldenke, Phytologia 6: 449--450. 1958.

The type, Weberbauer 873, deposited in the herbarium of the Botanisches Museum at Berlin, was photographed there by Macbride as his type photograph number 17594, but is now destroyed.

Additional citations: PERU: Puno: Weberbauer 873 [Macbride photos 17594] (W--photo of type).

CITHAREXYLUM LIGUSTRINUM Van Houtte

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1238 & 1241. 1924; H. B. Davis, Life & Works Pringle 217.

1936; Moldenke, Phytologia 6: 450--453. 1959; Bullock, Taxon 9: 99. 1960; Langman, Select. Guide Lit. Flow. Pl. Mex. 715 & 1010. 1964; Moldenke, Résumé Suppl. 13: 1. 1966.

This plant has been collected in anthesis in June. Material has been misidentified and distributed in herbaria under the name C. lucidum Schlecht.

Additional citations: MEXICO: Federal District: Paray 549 (Ip). Hidalgo: Pringle 15608 (Ca--168240, Gg--421297, Mi, St).

CITHAREXYLUM LUCIDUM Schlecht. & Cham.

Additional synonymy: Citharexylum lucidum Schlecht. ex Moldenke, Résumé Suppl. 13: 6, in syn. 1966.

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1238 & 1240. 1924; Moldenke, Phytologia 6: 454--456. 1959; Moldenke, Résumé Suppl. 13: 1 & 6. 1966.

Rzedowski encountered this species growing in Liquidambar forests, fruiting in May. The Paray 549, distributed as C. lucidum, is actually C. ligustrinum Van Houtte.

Additional citations: MEXICO: San Luis Potosí: J. Rzedowski 10502 (Ip). Vera Cruz: Liebmann 11365 (Bi), 15486 (Bi).

CITHAREXYLUM LYCIOIDES D. Don

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1241. 1924; Moldenke, Phytologia 6: 456--458. 1959.

The Lundells describe this species as a slender shrub, 5 feet tall, with orange-red "berries" [they are actually drupes], growing on limestone hills, fruiting in August. Material has been misidentified and distributed in herbaria as C. tetramerum T. S. Brandeg. See further notes of possible application to the present species under C. rosei var. durangense Moldenke.

Additional citations: MEXICO: Hidalgo: Lundell & Lundell 12332 (Mi, N, Rf).

CITHAREXYLUM MACRADENIUM Greenm.

Additional bibliography: Moldenke, Phytologia 6: 458--460 (1959) and 13: 285. 1966; Moldenke, Résumé Suppl. 13: 2. 1966.

Chrysler & Roever found this plant growing at 6800 feet altitude, flowering in July; Stork found it along roadsides at the edge of potreros.

Additional citations: COSTA RICA: Cartago: Stork 3283 (Mi, N). San José: Chrysler & Roever 5127 (Mi).

CITHAREXYLUM MACROPHYLLUM Poir.

Additional bibliography: Moldenke, Phytologia 6: 462--464. 1959; Moldenke, Résumé Suppl. 12: 3. 1965.

Berti describes this species as "Arbol, 24 m. altura total x 40 cm. Haz verde obscuro brillante. Envés verde claro mate. Nervio principal impreso por la haz; por el envés prominente y amarillento. Glándulas foliares: 2, ligeramente rosadas. Flores: blancas, fragrantes. Corola blanca; filamentos blancos.

Anteras marrón-cremosas. Cáliz verdoso. Estilo verdoso. Estigma amarillento". Steyermark says "tree 20 m. tall; leaves subcoriaceous, deep-green above, paler green below; fruiting sprays pendent, very showy; rachis pale buff-green; calyx pale green; fruit round-oblong, at first dull orange, then scarlet and shining, very showy, 15 mm. long, 12 mm. broad". Other collectors call it a tree or small tree, 8—15 m. tall, the trunk 30 cm. in diameter, the flowers white and very fragrant [Murça Pires says: "flôres alvas, como flôres de mamão"], growing at 65 to 800 m. altitude, flowering in February and May, fruiting in November. The vernacular names "cerezillo", "comida de pombo", "totumillo blanco", and "totumillo negro" are recorded for it. A wood voucher for Murça Pires 51847 is deposited in some museums.

Material has been widely misidentified and distributed in herbaria under the names C. poeppigii Walp., C. poeppiggii Walp., and C. poeppigui Walp. In fact, the Aristeguieta 2787, G. A. Black 48-2491 & 50-9081, and Murça Pires 528, 3175, & 3209, cited by me in Phytologia 6: 500 (1959) as C. poeppigii, are all C. macrophyllum instead. On the other hand, the Bernardi 7190, distributed as C. macrophyllum, is actually C. poeppigii Walp. Murça Pires 528, cited below from Amazonas, Brazil, also has the word "Vaupés" and the phrase "galhos novos ôcos" on its label. The Mell & Mell 247, cited by me in Phytologia 6: 463 (1959) as C. macrophyllum, appears to be C. spinosum L.

Additional citations: COLOMBIA: Valle del Cauca: Lehmann B.T. 645 (A). VENEZUELA: Aragua: Aristeguieta 2787 (N). Bolívar: Bernardi 7190 (N). Delta Amacuro: L. M. Berti 166 (N, Z); J. A. Steyermark 87472 (N). BRAZIL: Amazonas: G. A. Black 48-2491 (N, N); Murça Pires 528 (N, N, N). Pará: G. A. Black 50-9081 (N); Murça Pires 3175 (N), 3209 (N, Z), 51847 (N); N. T. Silva 57802 (N).

CITHAREXYLUM MATUDAE Moldenke

Bibliography: Moldenke, Phytologia 9: 98—99. 1963; Moldenke, Biol. Abstr. 43: 643. 1963; Hocking, Excerpt. Bot. A7: 454. 1964.

Matuda found this plant growing in advanced forests, at 2786 meters altitude, fruiting in May.

Citations: MEXICO: Chiapas: Matuda 5467 (Ld—type, Z—isotype), 5492 (Ld).

CITHAREXYLUM MEXICANUM Moldenke

Additional bibliography: Moldenke, Phytologia 6: 464—465. 1959; Langman, Select. Guide Lit. Flow. Pl. Mex. 515. 1964.

CITHAREXYLUM MIRIFOLIUM Moldenke

Additional bibliography: Moldenke, Phytologia 7: 76. 1959.

Cuatrecasas & Castaneda describe this species as a tree, 8 m. tall, with erect branches, the leaves coriaceous, yellowish-green, very shiny above, the fruit blackish-brown, growing at al-

titudes of 2700--2800 meters, fruiting in November.

Additional citations: COLOMBIA: Magdalena: Cuatrecasas & Castaneda 24683 (W--2325408), 25221 (Z).

CITHAREXYLUM MOCINNI D. Don

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1237 & 1239. 1924; Moldenke, Phytologia 7: 76. 1959.

Additional citations: MEXICO: Chiapas: Matuda 1884 (Du--361295), 4537 (Rf). México: Hinton 5393 (Rf), 8744 (Ca--939137, Rf, Ur). Vera Cruz: Liebmann 15489 (Bi).

CITHAREXYLUM MOCINNI var. LONGIBRACTEOLATUM Moldenke

Additional bibliography: Moldenke, Phytologia 6: 471--472. 1959.

One branch of Matuda 5014, in the Lundell Herbarium, has inconspicuous bractlets, while the other branch has the typical elongated bractlets. Matuda 408, in the same herbarium, is inscribed "type collection" in error -- the type is Matuda S.181.

Additional citations: MEXICO: Chiapas: Matuda 408 (Ld, Mi), 2663 (Ca--913669, Du--359921), 3923 (Rf), 5014 (Ld).

CITHAREXYLUM MONTANUM var. CHIMBORAZENSE Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 27: 2026. 1953; Moldenke, Phytologia 6: 474. 1959.

CITHAREXYLUM MONTEVIDENSE (Spreng.) Moldenke

Additional synonymy: Citharexylum montevidensis (Spreng.) Moldenke, Phytologia 7: 30, sphalm. 1959. Citharexylum barbinerva Cham. ex Moldenke, Résumé Suppl. 3: 30, in syn. 1962. Citharexylum montevidense Spreng. ex Moldenke, Résumé Suppl. 9: 3, in syn. 1964.

Additional bibliography: Arechavaleta, Anal. Mus. Nac. Montev. 4: 149--152, pl. 1. 1902; Herter, Estud. Bot. Reg. Urug. 8b: 201. 1933; Angely, Fl. Paran. 7: 11. 1957; Moldenke, Phytologia 7: 76. 1959; Angely, Fl. Paran. 16: 45. 1960; A. R. Schultz, Inst. Tec. Rio Grande do Sul Publ. 30: 15. 1960; Rambo, Pesquis. Bot. 4: 18 (1960) and 12: 21. 1961; Troncoso, Bol. Soc. Argent. Bot. 9: 181 & 185. 1961; Lombardo, Arbust. & Arbustil. Pas. Publ. 313. 1961; Angely, Fl. Paran. 17: 46. 1961; Angely, Bibl. Veg. Paran. 195. 1964; Rambo, Pesquis. Bot. 21: 14 & [59]. 1965; Moldenke, Résumé Suppl. 13: 6. 1966.

Recent collectors describe this plant as a shrub, 3 m. tall, or a small tree, 4--5 m. tall, often shrubby, the buds carrot-red [612, Roy. Hort. Soc. Colour Chart 1938-42], the flowers fragrant, the corolla yellow [Pedersen 5161] or Chinese-yellow [606/2, Roy. Hort. Soc. Colour Chart 1938-42; Bracelin 1327], and the fruit succulent, red, flowering in May, June, and October, and fruiting in December and January. It has been found in thickets by small streams, on banks of arroyos, and in valleys with outcrops of coarse calcareous sandstone. Pedersen calls it "common in thick-

ets on moist ground" in Paraguay. Troncoso (1937) says "Lo he visto cultivado en algunas calles de Martínez (Bs. Aires); además, según el ingeniero L. R. Parodi existe en el parque 3 de Febrero, una avenida arbolada con esta especie." She cites her no. 189 from the garden of the Bot. Fac. Agr. in Buenos Aires.

Herter (1937) lists the additional common names "espina de los bañados", "naranjo de bañado", and "tarumán de espinas". Arechavaleta (1902) comments on a tendency toward dioecism in this species, while Troncoso (1961) calls it definitely dioecious. A cotype of C. barbinerve, Sellow s.n. [Brasilia], and a specimen of Sellow 1421, deposited in the herbarium of the Botanisches Museum at Berlin, were photographed there by Macbride as his type photograph number 17591, but are now destroyed. The Sehnem 5071, distributed as C. montevidense, is actually C. solanaceum Cham.

Rambo (1965) cites Herb. Anchieta 8313, 8368 [Emrich s.n.], 9348, 26234, 29666 [Henz s.n.], 34379 [Emrich s.n.], 44323, 58790 [Camargo 228], 60702 [Machado s.n.], and 63935 [Sacco 462] from Rio Grande do Sul, Brazil, all collected by himself except where otherwise indicated. He describes the species as a "Medium tree, up to 15 m high", growing in "Campos woodlets, gallery, secondary growth" of the "Southern Campos area" of that state, with a general distribution "From Minas Gerais and Paraguay through South Brazil to Uruguay, and through Argentine Mesopotamia to B. Aires." He cites Schauer's work in Mart., Fl. Bras. as "1951" instead of 1851.

Additional citations: BRAZIL: Santa Catarina: Sellow 1879 [Macbride photos 17591, in part] (W--photo), s.n. [Brasilia; Macbride photos 17591, in part] (W--photo). PARAGUAY: Pedersen 5161 (S, W--2432853). URUGUAY: Arechavaleta 42 (Mi); H. H. Bartlett 21264 (Au--194871, Mi, W--2320273), 21287 (Au--194883, Mi, W--2320280), 21330 (Au--194858, Mi). ARGENTINA: Buenos Aires: Briderolli 4032 (W--1987946). Corrientes: Pedersen 5379 (S, W--2432745). CULTIVATED: California: Bracelin 1327 (Gg--339915, Go); Chisholm s.n. [3 June 1952] (Gg--412680).

CITHAREXYLUM MYRIANTHUM Cham.

Additional synonymy: Cytharexylon myrianthum Cham. ex Moldenke, Résumé Suppl. 3: 31, in syn. 1962.

Additional bibliography: Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 198. 1893; Reitz, Anais Bot. 2: 28 & 37. 1950; Angely, Fl. Paran. 7: 11. 1957; Reitz, Sellowia 11: 77 & 97. 1959; Veloso & Klein, Sellowia 11 (10): 99 & table opp. p. 76. 1959; Moldenke, Phytologia 7: 76. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 149. 1960; Angely, Fl. Paran. 16: 45 (1960) and 17: 46. 1961; Rambo, Pesquis. Bot. 12: 21 (1961) and 14: 33. 1961; Veloso & Klein, Sellowia 15: 102. 1963; Moldenke, Résumé Suppl. 12: 3. 1965; Rambo, Pesquis. Bot. 21: 14--15 & [59]. 1965.

Recent collectors describe this plant as a tree, 5--10 m. tall, or a very tall tree, with white flowers, blooming from October to

December, growing in capoeira, at altitudes of 95 to 500 meters. Additional vernacular names recorded for it are "café do mato", "pau de tucano", and "torumã".

A cotype, Sellow 650, deposited in the herbarium of the Botanisches Museum at Berlin, was photographed there by Macbride as his type photograph number 17597, but is now destroyed. Similarly, the type of C. macranthum, Fiebrig 596, in the same herbarium, photographed by him as his type photograph number 17596, is also now destroyed. The United States National Herbarium specimen of Rojas 14536 looks almost exactly like material now passing as C. rigidum (Briq.) Moldenke. These two taxa need more intensive study to determine if they are really distinct.

Rambo (1965) cites Herb. Anchieta 1079, 2753, 11264 [Emrich s.n.], 11266 [Emrich s.n.], 26659, 26946, 30606, 32681 [Henz s.n.], 32737 [Henz s.n.], 33757 [Emrich s.n.], 45138, 59803 [Camargo 1138], 61717 [Camargo 2541], and 61792 [Camargo 2603] from Rio Grande do Sul, 50926 [Hatschbach 1653] from Paraná, and 48431 [Reitz 4640], 48432 [Reitz 4641], and 55296 [Reitz 4749] from Santa Catarina, Brazil, all collected by himself except where otherwise indicated. He refers to the species as a "Medium tree, up to 15 m high", growing in "Campos woodlets, gallery, edge of rain forest, preferably on moist soil" and "All collections from the northeastern quadrant except for the Highlands proper" in Rio Grande do Sul. He gives its general distribution as "Bahia to RGS [Rio Grande do Sul]; Paraguay to Misiones".

Additional citations: BRAZIL: Bahia: Sellow 650 [Macbride photos 17597] (W—photo of cotype). Guanabara: A. Castellanos 23440 [Herb. Cent. Pesq. Florest. 1700] (Ac); Lanna Sobrinho 527 [Herb. Cent. Pesq. Florest. 2202] (Ac); B. Lutz 1207 (Ja—114110, Ja, Ja, Ja, Ja, Ja), 1410 (Ja—114099, Ja); Palacios, Balegno, & Cuezzo 4017 (Ja—54404, Ja). Rio de Janeiro: Sampaio 7817 (Ja—44883, Ja, Ja, Ja), s.n. [Dec. 1916] (Ja—31549). Santa Catarina: Eq. Ecologia 150 (W—2120126); Klein 150 (W—2120127), 866 (N), 2325 (Gg); Reitz 2237 (W—2104847), 8237 (Ca—47509); Reitz & Klein 7607 (Mm), 8043 (Mm), 9280 (Gg). PARAGUAY: Fiebrig 596 [Macbride photos 17596] (W—photo); Hassler 5457 (G); Pedersen 3163 (W—2169410), 4243 (W—2283735); Rojas 14536 (W—2198144).

CITHAREXYLUM OLEINUM (Benth.) Moldenke

Additional synonymy: Citharexylum oleinum Moldenke, Résumé Suppl. 13: 6, in syn. 1966.

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1252. 1924; Moldenke, Phytologia 6: 487—489. 1959; Langman, Select. Guide Lit. Flow. Pl. Mex. 515 & 1010. 1964; Moldenke, Résumé Suppl. 13: 6. 1966.

McVaugh describes this plant as a shrub, 1—1.5 m. tall, with white scentless flowers, flowering in April, and abundant on north slopes of barrancas, at an altitude of 2700 meters. Re-

dowski found it growing at 1850—1900 meters altitude, in chaparral. His no. 7287, distributed as this species, is probably not verbenaceous.

Additional citations: MEXICO: Hidalgo: Paray 3200 (Ip). Querétaro: R. McVaugh 10360 (Mi). San Luis Potosí: J. Rzedowski 6030 (Ip), 6655 (Ip, Mi).

CITHAREXYLUM OVATIFOLIUM Greenm.

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1238 & 1240. 1924; H. B. Davis, Life & Works Pringle 153. 1936; Moldenke, Phytologia 6: 489—490. 1959.

The Paray 2264, distributed as C. ovatifolium, is actually C. hidalgense Moldenke.

CITHAREXYLUM PACHYPHYLLUM Moldenke

Additional bibliography: Moldenke, Phytologia 6: 491—492. 1959.

Additional citations: PERU: Lima: Asplund 11496 (W—2224430).

CITHAREXYLUM PENTANDRUM Vent.

Additional bibliography: M. Kunz, Anatom. Untersuch. Verb. 72. 1911; Moldenke, Phytologia 6: 492—496. 1959.

xCITHAREXYLUM PERKINSI Moldenke

Additional synonymy: Citharexylum perkinsii Moldenke, Résumé Suppl. 10: 5, in syn. 1964.

Additional bibliography: Moldenke, Phytologia 6: 496—497. 1959; Moldenke, Résumé Suppl. 10: 5. 1964.

Alain describes this plant as a shrub, 2 m. tall, growing at 1300 meters altitude.

Additional citations: PUERTO RICO: Alain 9465 (N, N, N).

CITHAREXYLUM POEPPIGII Walp.

Additional synonymy: Citharexylum poeppigui Walp. ex Moldenke, Résumé Suppl. 12: 9, in syn. 1965. Citharexylum poeppiggii Walp. ex Moldenke, Résumé Suppl. 13: 6, in syn. 1966.

Additional bibliography: Soukup, Biota 4: 172. 1962; Moldenke, Phytologia 7: 76. 1959; Moldenke, Résumé Suppl. 12: 3 & 9 (1965) and 13: 2, 3, & 6. 1966; Moldenke, Phytologia 13: 284 & 297. 1966.

Recent collectors describe this plant as a tree, 15—26 m. tall, the trunk 90 cm. in diameter, the leaves subcoriaceous, deep-green above, paler-green beneath, the fruiting sprays pendent, very showy, the rachis pale buff-green, the calyx pale-green, and the fruit round or round-oblong, at first green, then dull-orange, finally vivid-red or scarlet and shiny, very showy, 15 mm. long and 12 mm. wide, growing in forests at altitudes of 65 to 850 meters, flowering in February and April, fruiting in March and November. Bernardi says "Tronco hueco; corteza marrón gris, oscura; madera marrón rosada; hojas discoloras; flores cuando abiertas amarillas; hojas verticiladas [but they are decussate-opposite on all the specimens cited below], glandulas escu-

teliformes sobre los pecíolos."

Additional vernacular names recorded for the species are "cerezillo", "mullahuayo", "quineillia blanco", and "totumillo negro". Material has been misidentified and distributed in herbaria as C. decorum Moldenke and Guettarda sp., while Cardona 1421 was first identified as something in the Bignoniaceae, then in the Combretaceae! The Cuatrecasas 15949 & 17606, cited by me in Phytologia 6: 500 (1959) as C. poeppigii, prove on closer examination to be C. poeppigii var. calvescens Moldenke, while Aristeguieta 2787, Black 48-2491 & 50-9081, and Murça Pires 528, 3175, & 3209 are C. macrophyllum Poir. The L. M. Berti 166 and Steyermark 87472, distributed as C. poeppigii, are actually C. macrophyllum, Ownbey 2715 is C. poeppigii var. margaritaceum Poepp. & Moldenke, and R. E. Schultes 3381 is C. ulei Moldenke.

Additional citations: VENEZUELA: Amazonas: Cardona 1421 (Ve). Bolívar: Bernardi 6739 (N), 7190 (Ve--47633). Delta Amacuro: Steyermark 87472 (N). PERU: Loreto: Schunke 365 (W--1459252). San Martín: Woytkowski 7095 (W--2452821), 7116 (W--2453515).

CITHAREXYLUM POEPPIGII f. ANOMALUM Moldenke

Bibliography: Moldenke, Phytologia 8: 459. 1963; Moldenke, Biol. Abstr. 43: 1278. 1963; Hocking, Excerpt. Bot. A7: 454. 1964.

Little describes this plant as a tree, 8 m. tall, with a trunk diameter of 15 cm. at breast height, growing in the woods in a llano, at 100 meters altitude.

Citations: VENEZUELA: Barinas: E. L. Little 15087 (Ve). Bolívar: Bernardi 2142 (Ve--type).

CITHAREXYLUM POEPPIGII var. CALVESCENS Moldenke

Bibliography: Moldenke, Phytologia 8: 459. 1963; Moldenke, Biol. Abstr. 43: 1278. 1963; Hocking, Excerpt. Bot. A7: 454. 1964.

Cuatrecasas describes this plant as a tree or "arbolito; tallo 8 cm. diám., blanquecino con estribos basilares; corteza ocráceo blanquecina mas o menos rugulosa y escamosa; madera blanco ocrácea; hoja membranosa verde claro; calíx verde pálido; corola blanco verdosa, tubo de la corola blanco verdoso, limbo blanco" and found it growing in woods, at 5--80 meters altitude, blooming in February and May. Both his collections were regarded by me as typical C. poeppigii in Phytologia 6: 500 (1959).

Citations: COLOMBIA: Valle del Cauca: Cuatrecasas 15949 (N--type), 17606 (N).

CITHAREXYLUM POEPPIGII var. MARGARITACEUM Poepp. & Moldenke

Additional bibliography: Moldenke, Phytologia 6: 500--501. 1959; Moldenke, Résumé Suppl. 12: 3. 1965.

Harling describes this as a small tree, with white flowers, growing in potreros, and flowering in December.

Additional citations: ECUADOR: Napo-Pastaza: Harling 3650 (S); Ownbey 2715 [Herb. U. S. Nat. Arb. 217809] (W). PERU: Loreto: Klug 3943 (W--1458369).

CITHAREXYLUM PTEROCLADUM Donn. Sm.

Additional bibliography: Moldenke, Phytologia 7: 77 (1959) and 13: 292. 1966.

The flowers on Hinton 13738 are described as "blue", while those on Skutch 2021 were "pale lavender with deeper purple streaks on lower lobes". Steyermark 45851, distributed as C. pterocladum, is actually C. hexangulare Greenm.

Additional citations: MEXICO: Chiapas: Matuda 18484 (Ca--903787). Guerrero: Hinton 14082 (Mi, Rf). Michoacán: Hinton 12631 (Mi, Rf), 13738 (Rf, Ur, W--1843285), 13739 (Rf, Rf, Ur, W--1843286), 15852 (Mi). GUATEMALA: Quezaltenango: Skutch 2021 (W--1644388, W--1644389).

CITHAREXYLUM PUNCTATUM Greenm.

Additional synonymy: Aegiphila punctatum Greenm. ex Moldenke, Résumé Suppl. 12: 9, in syn. 1965.

Additional bibliography: Soukup, Biota 1: 180. 1956; Moldenke, Phytologia 6: 504--505. 1959; Moldenke, Biol. Abstr. 33: 1862. 1959; Moldenke, Résume Suppl. 12: 9. 1965; Moldenke, Phytologia 13: 280. 1966.

Material has been misidentified and distributed in herbaria as C. argutedentatum Moldenke and as Terminalia sp.

Additional citations: BOLIVIA: Cochabamba: M. Cárdenas 5464 (W--2250912); Collector undesignated 5 (W--2320699); Diers 759 (Ko). La Paz: H. H. Rusby 2058 (W--32353). Department undetermined: Collector undesignated 186 [Liriuni] (W--2428140).

CITHAREXYLUM QUERCIFOLIUM Hayek

Additional bibliography: Moldenke, Phytologia 7: 7--8. 1959; Moldenke, Biol. Abstr. 34: 481. 1959; Hocking, Excerpt. Bot. A5: 43. 1962; Moldenke, Résumé Suppl. 12: 3. 1965.

The type specimen, Weberbauer 4248, deposited in the herbarium of the Botanisches Museum at Berlin, was photographed there by Macbride as his type photograph number 17598, but is now destroyed. The species was collected by Ellenberg at an altitude of 2800 meters. Material has been misidentified and distributed in herbaria as C. weberbaueri Hayek.

Additional citations: PERU: Cajamarca: Weberbauer 4248 [Macbride photos 17598] (W--photo of type). La Libertad: Ellenberg 1946 (Ut--163205b).

CITHAREXYLUM QUITENSE Spreng.

Additional bibliography: Hayek in Engl., Bot. Jahrb. 42: 170. 1908; Moldenke, Phytologia 7: 8--10 (1959) and 13: 284. 1966.

The type specimen of C. molle, Bonpland 3817, deposited in the

Bonpland Herbarium at the Muséum National d'Histoire Naturelle at Paris, was photographed there by Macbride as his type photograph number 39481. The Ellenberg 1489, distributed as C. quitense, is actually C. chartaceum Moldenke.

Additional citations: ECUADOR: Guayas: Asplund 5170 (Gg--405068, W--2223701); Bonpland 3817 [Macbride photos 39481] (W--photo).

CITHAREXYLUM RACEMOSUM Sessé & Moc.

Additional bibliography: Moldenke, Phytologia 7: 10--11. 1959.

Illustrations: Sessé & Moc., Fl. Nouv. Hisp., ed. 2, pl. 418. 1893.

Dr. Rogers McVaugh, in a letter to me dated October 11, 1963, sent me a photograph of the original Sessé & Mocino plate depicting this plant, with the comment: "Plate 418 of the Plantae Novae Hispaniae (cited on p. 96, ed. 2). The type-locality is Parangueo (not Paranques as published) near Salamanca, Guanajuato. I suppose this is a valid species unless it is a synonym of something else." Recent collectors describe the plant as a shrub, to 2.5 m. tall, with orange-red fruit, growing in gray or brown gravelly soils in thorn-scrub-cactus association, at 1000 meters altitude, and fruiting in July.

Additional citations: MEXICO: Puebla: Smith, Peterson, & Tejeda 4121 (W--2398123, Z).

CITHAREXYLUM REITZII Moldenke

Additional bibliography: Angely, Fl. Paran. 7: 6. 1957; Moldenke, Phytologia 7: 12--13. 1959; Rambo, Pesquis. Bot. 21: 15 & [59]. 1965.

Reitz & Klein describe this species as a shrub, 3 m. tall, the immature fruit green, growing at an altitude of 350 meters, flowering and fruiting in December.

Rambo (1965) cites Herb. Anchieta 30452 [Reitz 1002] from Santa Catarina, Brazil. He describes the species as a "Small tree", growing in "Half-high woodlet" in "Southernmost SC [Santa Catarina], near northeasternmost coast of RGS [Rio Grande do Sul]" and gives its general distribution as "SC".

Additional citations: BRAZIL: Santa Catarina: Reitz & Klein 8022 (Z).

CITHAREXYLUM RETICULATUM H.B.K.

Additional bibliography: Moldenke, Phytologia 7: 13--14. 1959.

The type specimen, Bonpland 3419, deposited in the Bonpland Herbarium at the Muséum National d'Histoire Naturelle at Paris, was photographed there by Macbride as his type photograph number 39479.

Additional citations: ECUADOR: Loja: Bonpland 3419 [Macbride photos 39479] (W--photo of type).

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GRAFIA, A NEW GENUS OF ORCHIDS

Alex D. Hawkes

The genus Phalaenopsis of Blume has long been a popular one with orchid collectors, and has in the past received considerable published attention from students, serious and casual, of the family. But it is only in recent years that we have seriously considered the components of this group, which dates from the year 1825.

As is well known, in the early days of botany, a truly diverse array of orchids was named, by different authors, as Phalaenopsis— a condition which also prevailed in Cymbidium, Dendrobium, Epidendrum, etc. Now, segregates from Phalaenopsis Bl. have been established (or re-evaluated) and accepted, these Doritis Ldl., Kingiella Rolfe, and Paraphalaenopsis A. D. Hawkes.

Considerable additional critical study of the orchids we still consider as Phalaenopsis remains to be done. The genus, as it is presently delimited, is still a motley assemblage of plants, several of which should be segregated as distinct taxa.

Reichenbach's plant named Phalaenopsis Parishii in 1865 is one of these, one which now requires our serious consideration. This had been collected in Moulmein, Burma, by the Rev. C. S. Parish, and introduced into England by Messrs. Low and Co.the previous year. It has, for more than a century, been in cultivation, yet though its aberrancy in its genus has been commented upon in the literature, no orchidologist has resolved the problem.

I am convinced that this orchid constitutes a genus of a single somewhat variable and rather widespread species, amply distinct from Phalaenopsis of Blume. I therefore propose the following new genus to accommodate it.

GRAFIA A. D. Hawkes, gen. nov.

Differt ab Phalaenopsis Blume in labellum libere mobilum, crista semi-lunata valde fimbriataque, antice appendix angusta, 4-divisa angustissima ornata.

A genus of a single species, ranging from the Himalayas to Burma. It differs from Phalaenopsis Bl. in its freely mobile labellum, which bears a semi-lunate crest, this strongly fimbriate; this is followed, anteriorly down the segment, by a forward-thrust, narrow appendage, this divided almost to its base into a quartet of slender filaments.

I would temporarily place the new genus in somewhat closer proximity to Ornithochilus Wall. than to Phalaenopsis Bl. itself, but believe that additional study of the entire alliance may alter this opinion. Since Grafia is present in choice contemporary collections, further fresh materials of the flowers will be welcome from my correspondents for study.

I wish to propose the new genus to honor Alfred Byrd Graf, editor of the remarkable and internationally valued volumes entitled Exotica. As seems customary with such serious workers, Mr. Graf's efforts have been largely unacknowledged, and I am sure that all of us who value his labors will consider the epithet of the new genus singularly appropriate.

GRAFIA PARISHII (Rchb.f.) A.D.Hawkes, comb. nov.

Phalaenopsis Parishii Rchb.f. in Bot. Zeit. 146. 1865. Phalaenopsis Parishii Rchb.f. var. Lobbii Rchb.f. in Saund., Refug. Bot. 1: pl. 85.

Distribution: Sikkim, Bhutan, and Assam to Moulmein and Tenasserim districts in Burma.

This unique plant is frequently deciduous in the wild, rarely so under cultivation. The Himalayan phase, described as a distinct variety by Reichenbach, does not differ save in coloration, hence is here considered a synonym of the typical species.

Grafia Parishii is taken up in greater detail in The Orchid Weekly, Vol. 5, 1966, to which the interested reader is referred. It is described as Phalaenopsis Parishii Rchb.f. in my Encyclopaedia of Cultivated Orchids 368. 1965, and is illustrated as Phalaenopsis Parishii Lobbii in Graf's Exotica 3: 1305. 1963.

This is a very attractive, profusely-flowered orchid when well grown, and in future our avid breeders are certain to take it under serious consideration as a parent; we already have casual indication (see Orch. Weekly 4: 462. 1964) that some efforts have been made in this respect.

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NOTES ON NEW AND NOTEWORTHY PLANTS. XLV

Harold N. Moldenke

CLERODENDRUM GLABRUM var. VAGUM (Hiern) Moldenke, Prelim. Alph. List Invalid Names 40, hyponym. 1940; comb. nov.

Siphonanthus glabra var. vaga Hiern, Cat. Afr. Pl. Welw. 1: 842. 1900.

STACHYTARPHETA SCABERRIMA var. PILOSA Moldenke, var. nov.

Haec varietas a forma typica speciei ramis inflorescentiisque dense piloso-pubescentibus recedit.

This variety differs from the typical form of the species in having its stems, branches, peduncles, rachids, bractlets, and calyxes densely pilose-pubescent.

The type of the variety was collected by R. P. Belém (no. 1757) at the margin of Rodovia Camacan-Canavieiras, 32 km. west of Canavieiras, in the restinga, Bahia, Brazil, on September 8, 1965, and is deposited in the H. N. Moldenke herbarium at Plainfield, New Jersey. The collector notes that the plant was 1 m. tall and had blue flowers.

VERBENA LONGIFOLIA var. PUBESCENS Moldenke, var. nov.

Haec varietas a forma typica speciei ubique perspicue breviter pubescens recedit.

This variety differs from the typical form of the species in being conspicuously short-pubescent throughout.

The type of the variety was collected by D. E. Breedlove (no. 12292) on a steep slope with Quercus and Pinus, at an elevation of 7000 feet, 19 km. southwest of Sola de Vega, along the road to Puerto Escondido, Oaxaca, Mexico, on August 30, 1965, and is deposited in the H. N. Moldenke herbarium at Plainfield, New Jersey. The flowers are described as blue.

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A PROBLEM IN DENDROBIUM

Alex D. Hawkes

In an article published not long ago (in Orch. Rev. 73: 87 - 88. 1965.), R. E. Holttum has pointed out that the name of the commonly-cultivated orchid Dendrobium aggregatum Roxb. is a homonymic one, this in reference to a paper of mine in which certain such cases were taken up (l. c., 21 - 22. 1965.). Dr. Holttum, unfortunately, did not take time to discuss the correct epithet of this Dendrobium, and in none of his published works, nor his book, has he done so. This seems regrettable, since he is so vehement about my failure to attend to this matter.

It is indeed puzzling that none of us who have worked with the huge and complex Dendrobium alliance has attended to this rather obvious situation, one which I herewith rectify.

Three totally distinct orchids have been described as Dendrobium aggregatum. In this case, the species in common and widespread cultivation under this name dates from 1832, when the epithet used by Roxburgh in 1814 was validated. In the interim,

however, in 1816, Humboldt, Bonpland, and von Kunth, following their explorations in the Americas, published an orchid which they named Dendrobium aggregatum. Since no true Dendrobiums occur in the Western Hemisphere, this has been shown to be referable to Maxillaria aggregata (HBK) Ldl.

The third orchid named Dendrobium aggregatum dates from 1828, by Nathanael Wallich; this is now referred to D. Griffithianum Ldl.

In my recent Encyclopaedia of Cultivated Orchids (Faber, London, 1965), I called this plant Dendrobium aggregatum Roxb., and also considered a variety amply distinctive. These erroneous decisions on my part, following Holttum and all previous writers on the subject, are hereby corrected.

The next available name for the plant so long known as Dendrobium aggregatum Roxb. is

DENDROBIUM LINDLEYI Steud., Nom., ed. 2, 1: 490. 1840.
Dendrobium aggregatum Roxb., Hort. Beng. 63. 1814; and Fl. Ind. 3: 477. 1832; not HBK, Nov. Gen. et Sp. 1: 358. 1816; nor Wall., Catal. no. 7411B. 1828.
Distribution: South China to Burma, Thailand, and Laos.

- var. JENKINSII (Wall.) A.D. Hawkes, comb. nov.
Dendrobium Jenkinsii Wall. in Ldl., Bot. Reg., pl. 37. 1839.
Dendrobium aggregatum Roxb. var. Jenkinsii Ldl.
Distribution: India: Assam; Burma.

A more lengthy, pertinent discussion of the problem is being published in The Orchid Weekly, Vol. 5, 1966, to which the interested student is referred.

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NOTES ON BULBOPHYLLUM — 1

Alex D. Hawkes

During the preparation of a check-list of the orchid subtribe Bulbophyllinae, for publication in my continuing "Index of Orchidaceous Plants," a number of taxonomic alterations have proved necessary.

The first of this series of notes considers a quartet of species of Bulbophyllum Thou. whose names require clarification.

BULBOPHYLLUM FLICKINGERIANUM A. D. Hawkes, nom. nov.
Bulbophyllum fimbriatum H. Perr. in Not. Syst., ed. Humbert, 9: 145. 1941, not Rchb. f. in Walp., Ann. 6: 260. 1861; nor H. Perr. in Not. Syst. 14: 1953. 1951.

Reichenbach's Indian Bulbophyllum fimbriatum, based on Lindley's Cirrhopetalum fimbriatum, predates both of Perrier de la Bathie's Malagasy plants by many years. I wish to propose the above new name to accommodate this species described from Madagascar, to recognize the considerable orchidological accomplishments of my colleague, Edward A. Flickinger.

BULBOPHYLLUM MAUDEAE A. D. Hawkes, nom. nov.
Bulbophyllum nigrilabium H. Perr. in Not. Syst. 14: 150. 1951, not Schltr. in Fedde, Repert. Spec. Nov., Beih. 1: 800. 1913.

Schlechter's Bulbophyllum nigrilabium, from New Guinea, predates that of Perrier de la Bathie by many years. The new name is proposed to recognize the indefatigable assistance of my generally unsung collaborator, Miss Maude Drum.

BULBOPHYLLUM MAYAE A. D. Hawkes, nom. nov.
Bulbophyllum fimbriatum H. Perr. in Not. Syst. 14: 1953. 1951; not Rchb. f. 1861; nor H. Perr. 1941.

As noted under Bulbophyllum Flickingerianum A. D. Hawkes, two of Perrier de la Bathie's Malagasy species named B. fimbriatum are homonymic because of the long-prior Bulbophyllum fimbriatum of Reichenbach filius. This new name is given to honor Mrs. May Moir, who has long afforded unique assistance to orchidists and orchidologists everywhere, and who delighted in the flora of the island of Madagascar.

BULBOPHYLLUM MOLDENKEANUM A. D. Hawkes, nom. nov.
Bulbophyllum microglossum H. Perr. in Not. Syst. 14: 151. 1951, not Ridl. in Jour. Linn. Soc. 38: 325. 1908.

Perrier de la Bathie's Bulbophyllum microglossum is an untenable name, being predated by that of Ridley for a completely different Malayan plant. I wish to propose the new epithet to honor, in a small degree, the efforts of Dr. Harold N. Moldenke, co-editor and publisher of Phytologia, a periodical which has done so much to facilitate contemporary botanical publication.

ADDITIONAL NOTES ON THE GENUS CITHAREXYLUM. III

Harold N. Moldenke

CITHAREXYLUM B. Juss.
Additional bibliography: Moldenke, Phytologia 13: 242 & 277—304. 1966; G. Taylor, Ind. Kew. Suppl. 13: 31. 1966.

CITHAREXYLUM BRACHYANTHUM (A. Gray) A. Gray
Additional synonymy: Citharexylum brachyanthum (A. Gray ex Hemsl.) A. Gray apud G. Taylor, Ind. Kew. Suppl. 13: 31. 1966.
Additional bibliography: Moldenke, Phytologia 13: 281—282. 1966; G. Taylor, Ind. Kew. Suppl. 13: 31. 1966.

CITHAREXYLUM FLABELLIFOLIUM S. Wats.
Additional bibliography: Moldenke, Phytologia 13: 286. 1966; G. Taylor, Ind. Kew. Suppl. 13: 31. 1966.

CITHAREXYLUM HIRTELLUM Standl.
Additional bibliography: Moldenke, Phytologia 6: 409—411. 1958.
Breedlove & Raven refer to the fruit of this plant as "berries", but they are actually drupes. These collectors found the plant growing on steep heavily wooded slopes, fruiting in October.
Additional citations: MEXICO: Chiapas: Breedlove & Raven 13625 (Z).

×CITHAREXYLUM JAMAICENSE Moldenke
Additional bibliography: G. Taylor, Ind. Kew. Suppl. 13: 31. 1966; Moldenke, Phytologia 13: 293. 1966.

CITHAREXYLUM MONTANUM Moldenke
Additional bibliography: Moldenke, Phytologia 6: 472—474 (1959) and 13: 298. 1966.

×CITHAREXYLUM PERKINSI Moldenke
Emended synonymy: Citharexylum perkinsii Moldenke, Résumé Suppl. 10: 5, in syn. 1964; G. Taylor, Ind. Kew. Suppl. 13: 31. 1966.
Additional bibliography: Moldenke, Phytologia 13: 301. 1966; G. Taylor, Ind. Kew. Suppl. 13: 31. 1966.

CITHAREXYLUM RIGIDUM (Briq.) Moldenke
Additional bibliography: Moldenke, Phytologia 7: 15—17 (1959) and 13: 300. 1966.

CITHAREXYLUM ROSEI Greenm.
Additional bibliography: P. C. Standl., Contrib. U. S. Nat.

Herb. 23: 1237 & 1239. 1924; Moldenke, Phytologia 7: 18—20. 1959; Moldenke, Biol. Abstr. 37: 1062. 1962; Hocking, Excerpt. Bot. A.5: 45. 1962; Moldenke, Phytologia 13: 296. 1966.

Recent collectors describe this plant as an "abundant treelike shrub, to 5 m. tall, trunk 10 cm. in diameter, flowers apparently purplish", growing in a stream valley and on bearby rocky oak-covered mountainside, or with Myrtillocactus and Opuntia in matorral, at 2000—2100 meters altitude, flowering in September, and fruiting in November. H. S. Gentry 8564 was collected in the "pass through Sierra Papantón near highway on Durango-Zacatecas border" and may, therefore, have actually come from either of these states.

Additional citations: MEXICO: Durango: H. S. Gentry 8564 (Ca—805272, Mi). San Luis Potosí: J. Rzedowski 8454 (Ip). Zacatecas: R. McVaugh 17670 (Mi, Mi, Z).

CITHAREXYLUM ROSEI var. DURANGENSE Moldenke

Additional & emended synonymy: Rauwolfia lycioides Lag. & Rodr., Anal. Cienc. Nat. 5: 69—70. 1802. Rauwolfia lycioides Cav. apud Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 693. 1895.

In a series of very interesting communications from Dr. Rogers McVaugh, dated October 11, November 5, and December 2, 1963, I learn that the University of Michigan negative 1700 depicts the original type specimen of Rauwolfia lycioides Lag. & Rodr. in the Madrid herbarium. "The same specimen was photographed by Macbride and you can see his number [29221] on the specimen." He continues "It seems probable that Citharexylum lycioides D. Don and Rauwolfia lycioides were based on different specimens from the same source.....Don's specimen came from Pavón, and according to Don it was thought by Pavón to be a new species of Rauwolfia..... Rauwolfia lycioides 'Cav.' was actually published by Lag. & Rodr. in a signed article; probably Cav. gets the credit, as in Index Kew., because he was the professor."

Recent collectors describe this plant as a small, spreading shrub, about 6 feet tall, with the fruit red when ripe, growing on low limestone hills, in rocky soil, or in Acacia constricta—nopal desert scrub on 20 degrees slope of calcareous gravel-and-boulder conglomerate, at altitudes of 1700—1900 meters, fruiting in July, September, and October. Johnston -- who refers to the fruits as "berries" [they are actually drupes] — calls the plant "scarce", while Gentry describes it as "common in chaparral".

Additional citations: MEXICO: Durango: Correll & Johnston 20211 (Rf); H. S. Gentry 8286 (Mi); M. C. Johnston 2824 (Au—123204). CULTIVATED: Spain: Herb. Hort. Bot. Matrit. s.n. [Herb. Univ. Mich. neg. 1700] (Z—photo).

CITHAREXYLUM ROSEI var. PILOSUM Moldenke

Bibliography: Moldenke, Phytologia 8: 14. 1961; Moldenke, Biol. Abstr. 37: 1062. 1962; Hocking, Excerpt. Bot. A.5: 45. 1962.

Citations: MEXICO: Jalisco: R. McVaugh 17152 (Mi--type, Z--isotype).

CITHAREXYLUM ROXANAE Moldenke

Bibliography: Moldenke, Phytologia 7: 429--430. 1961; Moldenke, Biol. Abstr. 36: 4036. 1961; Hocking, Excerpt. Bot. A.5: 44. 1962.

Carter describes this plant as having virgately branched striate stems to 2 m. long, the flowers "dried up, apparently did not set fruit", growing on a north-facing canyon and ridge, at an altitude of 700-900 m., in association with scattered Ficus palmeri, Celtis reticulata, Quercus tuberculata, Erythrina flabelliformis, Mimosa purpurascens, Bursera microphylla, Lophocereus schottii, Lemaireocereus thurberi, Hyptis emoryi, and Aloysia barbata.

Citations: MEXICO: Baja California: A. Carter 4123 (Ca--199595, Gg); Carter & Ferris 4000 (Ca--199586--type, Z--isotype).

CITHAREXYLUM SCABRUM Sessé & Moc.

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1238 & 1239. 1924; Moldenke, Phytologia 7: 21--23. 1959; Langman, Select. Guide Lit. Flow. Pl. Mex. 633 & 1010. 1964.

Waterfall found this plant growing on grassy limestone hillsides in Sinaloa.

Additional citations: MEXICO: Sinaloa: Edw. Palmer 1523 (Ca--770322); Waterfall 16266 (Z).

CITHAREXYLUM SCHOTTII Greenm.

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1238 & 1241. 1924; Moldenke, Phytologia 7: 23--26 (1959) and 13: 283. 1966.

The Gentle 4793, distributed as C. schottii, is actually C. caudatum L.

Additional citations: MEXICO: Quintana Róo: Lundell & Lundell 7781 (Du--361946, Rf). Yucatán: Lundell & Lundell 7878 (Du--363054, Rf), 8132 (Du--360781, Rf, Rf).

CITHAREXYLUM SCHULZII Urb. & Ekm.

Additional bibliography: Moldenke, Phytologia 7: 26--27. 1959.

Holdridge describes this plant as a shrub, 1 m. tall, the leaves rigid, the fruit red, globose, growing at 1750 meters altitude, fruiting in October.

Additional citations: HISPANIOLA: Haiti: Holdridge 1775 (Mi).

CITHAREXYLUM SESSAEI D. Don

Additional bibliography: M. Kunz, Anatom. Untersuch. Verb. 72--73. 1911; H. B. Davis, Life & Works Pringle 214. 1936; Moldenke, Phytologia 7: 27--28. 1959; Moldenke, Résumé Suppl. 13: 6. 1966; Moldenke, Phytologia 13: 279. 1966.

Hinton describes this plant as 3 m. tall, with white flowers, growing in a barranca at 2200 meters altitude, flowering in November; he notes that he found only "a few plants".

Additional citations: MEXICO: Michoacán: Hinton 15678 (N, N, Rf).

CITHAREXYLUM SHREVEI Moldenke

Additional bibliography: Moldenke, Phytologia 7: 28—29. 1959; Moldenke in Shreve & Wiggins, Fl. Son. Des. 2: 1259. 1964.

CITHAREXYLUM SOLANACEUM Cham.

Additional & emended bibliography: Rambo, Sellowia 7: 260 & 288. 1956; Angely, Fl. Paran. 7: 11. 1957; Moldenke, Phytologia 7: 29—30. 1959; Angely, Fl. Paran. 16: 45 (1960) and 17: 46. 1961; Rambo, Pesquis. Bot. 21: 15—16 & [59]. 1965; Moldenke, Phytologia 13: 299. 1966.

Smith & Klein found this species growing in forests and at forest margins. Rambo (1965) cites Herb. Anchieta 4812, 6559, 36422, 51106 [Sehnem 5071], 54255 [Emrich s.n.], & 54617 from Rio Grande do Sul, and 50922 [Hatschbach 1591] from Paraná, Brazil, all collected by himself except where otherwise stated. He calls it a "Small to medium tree, up to 10 m. high", growing in "Araucaria forests, secondary growth....All collections from the northeastern quadrant, especially the Highlands; only 6559 from the central slopes of the Highlands", with a general distribution "From Rio de Janeiro to RGS [Rio Grande do Sul]."

Additional citations: BRAZIL: Paraná: Reitz & Klein 17750 (Ac). Rio Grande do Sul: Sehnem 5071 (B, B). Santa Catarina: Smith & Klein 13219 (Ac). São Paulo: Puiggari 3330 (P).

CITHAREXYLUM SOLANACEUM var. MACROCALYX Moldenke

Additional bibliography: Moldenke, Phytologia 7: 31—32. 1959.

The type specimen, Sellow s.n., deposited in the herbarium of the Botanisches Museum at Berlin, was photographed there by Macbride as his type photograph number 17600, but is now destroyed, The Brescia & Borsani 3361, cited below, bears a notation "Corresponde a muestra No. 4225", but I have not as yet seen this latter collection.

Additional citations: BRAZIL: Rio Grande do Sul: Brescia & Borsani 3361 (Z). State undetermined: Sellow s.n. ["varietas"; Macbride photos 17600; Herb. U. S. Nat. Arb. 197511] (W—photo of type).

CITHAREXYLUM SPATHULATUM Moldenke & Lundell

Additional bibliography: Moldenke, Phytologia 7: 32—33. 1959.

Correll & Johnston describe this as a shrub, to 8 feet tall, growing on chalk cliffs, and fruiting in July. The Lundells describe it as "openly branched".

Additional citations: TEXAS: Hidalgo Co.: Lundell & Lundell 9953 (Mi—type), 12689 (Rf), 12774 (Rf). Starr Co.: Correll & Johnston 18059 (Rf); Lundell & Lundell 12676 (Rf).

CITHAREXYLUM SPINOSUM L.

Additional synonymy: Hadongia eberhardtii Gagnep. in Humbert, Not. Syst. 14: 30. 1950. Cytharexylon spinosum L. ex Moldenke, Résumé Suppl. 13: 6, in syn. 1966.

Additional & emended bibliography: Griseb., Cat. Pl. Cub. 216. 1866; Hayek in Engl., Bot. Jahrb. 42: 169. 1908; Britton & P. Wils., Scient. Surv. Porto Rico 6: 145 & 146. 1925; Robledo, Lecc. Bot. 2: 498. 1940; Neal, In Gard. Hawaii, ed. 1, 639. 1948; Gagnep. in Humbert, Not. Syst. 14: 30. 1950; E. J. Salisb., Ind.Kew. Suppl. 11: 106. 1953; Moldenke, Verb. 22--23. 1955; Moldenke, Phytologia 7: 77. 1959; Nair & Rehman, Bull. Nat. Bot. Gard. Lucknow 76: 10 & 23, pl. 1, fig. 6, text-fig. 16. 1962; Little & Wadsworth, U.S. Dept. Agr. Forest Serv. Agric. Handb. 249: 480. 1964; Moldenke, Résumé Suppl. 11: 5 (1964) and 12: 9. 1965; Gooding, Loveless, & Proctor, Fl. Barbados 356, 468, & 469. 1965; Neal, In Gard. Hawaii, new rev. ed., 725 & 726. 1965; Moldenke, Résumé Suppl. 13: 2 & 6. 1966; Moldenke, Phytologia 13: 283, 286, 287, 290, & 297. 1966; Anon., Short Guide Bermudas 7 & 16--17. n.d.

Additional illustrations: Nair & Rehman, Bull. Nat. Bot. Gard. Lucknow 76: pl. 1, fig. 6, text-fig. 16. 1962; Anon., Short Guide Bermudas 16 [in color]. n.d.

The type of Hadongia eberhardtii was collected by Philippe Albert Eberhardt (no. 3417), probably from cultivated material, at Hadong, Tonkin, Indochina, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. It was originally proposed in the Bignoniaceae, as the type species of a monotypic genus.

Wilder describes C. spinosum as a large spreading tree. Box affirms that on Antigua it is "occasional to frequent locally in woodlands, chiefly on xerophytic hillsides near the sea". W. R. Taylor 49-1155 represents a vigorous shoot and its leaves are deeply toothed. The flowers are described as "white" on G. L. Webster 1582, "cream" on Clemens & Clemens 3755, and "cream-colored" on O. E. White 18. White comments that girls in Burma wear its flowers in their hair.

The Mell & Mell 247, cited below, was erroneously cited by me as C. macrophyllum Poir. in Phytologia 6: 463 (1959). The A. R. Cooke s.n. [Manoa trail, 9/26/54] and Degener & Murashige 20075, distributed as C. spinosum, are actually C. caudatum L., while R. A. Howard 10733 and Purseglove P.6363 are C. fruticosum L., and Cowan & Forster 1278 [at least insofar as the Britton Herbarium specimen is concerned] is C. fruticosum var. brittonii Moldenke.

Nair & Rehman (1962) describe the pollen-grains of C. spinosum as follows: 3-zonicolporate, spheroidal (diameter 36 μ; range 32--39 μ); ectocolpium faint, ends pointed, crassimarginate; endocolpium lalongate (3.5 x 10.5 μ), the lateral ends slightly rounded; exine 2 μ thick; ectine slightly thicker than the endine, psilate (faint LO), based on Herb. Nat. Bot. Gard. Lucknow 16722, slide 2621, not seen as yet by me.

Little & Wadsworth (1964) say "A related species of péndula (Citharexylum spinosum L.), also known as susana, is wild and planted in St. Croix and St. Thomas and ranges southward to northern South America. It has elliptic leaves 3—8 inches long, thin, hairless, and with prominent network of small veins when dry, and oblong shiny black fruits 3/8 inch long."

Additional citations: BERMUDA ISLANDS: Hamilton: W. R. Taylor 49-1155 (Mi). Main: Bailey, Bailey, Whetzel, Degener, & McCallan s.n. [Experiment Station, Sept. 10, 1921] (Bi). Saint Georges: W. R. Taylor 49-1114 (Mi). LEEWARD ISLANDS: Antigua: Box 1176 (Mi). Guadeloupe: Questel 4627 (W—2453704), 4663 (W—2453681), 4949 (W—2453677), 5066 (W—2453703). WINDWARD ISLANDS: Martinique: Sieber Fl. Mart. 156 (P); Stehlé & Stehlé 5045 (W—2453707), 6819 (W—2453705). TOBAGO: W. E. Broadway 3821 (P). BRITISH GUIANA: Irwin 510 (W—2212846); Mell & Mell 247 (N). FRENCH GUIANA: Martin s.n. [Cainne] (P). INDIA: Mysore: Ramaswany 642 (Lw). INDOCHINA: Tonkin: Eberhardt 3417 (P). POLYNESIA: HAWAIIAN ISLANDS: Oahu: G. L. Webster 1582 (Mi, W—2132472). CULTIVATED: Burma: O. E. White 18 (W—2073086). Curaçao: Arnoldo 2089 (W—2110507). Fiji Islands: G. P. Wilder 1234 (Bi, Ca—948871). Hawaiian Islands: C. M. Cooke s.n. [May 10, 1941] (Bi); A. F. Judd s.n. [Hakipuu, July 3, 1939] (Bi, Bi); H. N. Moldenke 21854 (Mi); Teixiera s.n. [May 27, 1937] (Bi). Indochina: Clemens & Clemens 3755 (W—1428066). Java: Herb. Hort. Bogor. XI.G.17a (N). Senegal: Adam 16948 (Mm), 16949 (Mm).

CITHAREXYLUM STANDLEYI var. MEXICANUM Moldenke

Additional bibliography: Moldenke, Phytologia 7: 47. 1959.

McVaugh describes this plant as tree-like, 4 m. tall, with greenish-white flowers, blooming in July, and found it on a grassy slope of mountain summit in deciduous woodland dominated by various legumes, Bursera, and Cnidoscolus, at 500 meters altitude.

Additional citations: MEXICO: Colima: R. McVaugh 15551 (Mi).

CITHAREXYLUM STEYERMARKII Moldenke

Additional bibliography: Moldenke, Phytologia 7: 48—49. 1959; Moldenke, Biol. Abstr. 34: 481 (1959) and 35: 1465. 1960; Hocking, Excerpt. Bot. A.5: 43. 1962.

CITHAREXYLUM SUBEROSUM Loes.

Additional bibliography: Moldenke, Phytologia 7: 49—50. 1959; Soukup, Biota 3: 30. 1960; G. Taylor, Ind. Kew. Suppl. 13: 31. 1966.

CITHAREXYLUM SUBFLAVESCENS Blake

Additional synonymy: Citarexylum subflavescens Blake ex Moldenke, Résumé Suppl. 6: 9, in syn. 1963.

Additional bibliography: Moldenke, Phytologia 7: 50--53. 1959; Moldenke, Résumé Suppl. 6: 9. 1963.

Bernardi says of this plant "madera resistente a la intemperie -- bayas rojas -- especie aparentemente restringida a la zone 'selva nublada'" and records the common name "salvio". Hueck found it at 3000 meters altitude. Steyermark describes it as a tree, 8--10 m. tall, the calyx olive-green, corolla white, rachis green-buff, leaves dark-green above, olive-green beneath, and petioles olive-green, growing in cloud forest at 2200 meters altitude, blooming in July.

Additional citations: VENEZUELA: Aragua: H. Pittier 9333 (Mv); J. A. Steyermark 94298 (Z). Mérida: Bernardi 2069 (Ve--47658). Táchira: Hueck s.n. [Paramo la Negra, 10.4.1958] (Ve--42762), s. n. [Paramo la Negra, 27.5.58] (Ve--42762, Ve).

CITHAREXYLUM SUBTHYRSOIDEUM Pittier

Additional bibliography: Moldenke, Phytologia 7: 53--55 (1959) and 13: 284. 1966.

Steyermark describes this plant as a vining shrub, the leaves firmly membranous, dull-green on both surfaces, and the flowers greenish-yellow, inhabiting dry reforested slopes, flowering in June. Material has been misidentified and distributed in herbaria as C. dawei Moldenke.

Additional citations: VENEZUELA: Federal District: Aristeguieta 793 (Ve--32606); Lasser 742 (W--1879594); J. A. Steyermark 86308 (W--2430158). Lará: Tamayo 3757 (Ve--30045).

CITHAREXYLUM SULCATUM Moldenke

Additional bibliography: Moldenke, Phytologia 7: 56--58. 1959.

Recent collectors describe this plant as a small tree, 6 m. tall, trunk 7 cm. in diameter at breast height, bark gray, slightly fissured, leaves coriaceous, deep-green, calyx green, and fruits shiny-green, becoming violaceous, inhabiting canyon slopes, at 2600--3100 meters altitude, flowering in June, and fruiting in September.

A specimen of Triana 2072, deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, was photographed there by Macbride as his type photograph number 28398, but is not a type.

Additional citations: COLOMBIA: Cundinamarca: Cuatrecasas, Jaramillo, & Huertas 25833 (Z); Køie 5067 (W--2253541); Little & Little 9201 (N); Triana 2072 [Macbride photos 28398] (W--photo).

CITHAREXYLUM TETRAMERUM T. S. Brandeg.

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1237 & 1238. 1924; Moldenke, Phytologia 7: 61--63 (1959) and 13: 296. 1966.

The Lundell & Lundell 12332, distributed as C. tetramerum, is actually C. lycioides D. Don.

CITHAREXYLUM TRISTACHYUM Turcz.

Additional synonymy: Citharexylum tristachuym Turcz., in herb.

Additional bibliography: M. Kunz, Anatom. Untersuch. Verb. 73. 1911; Moldenke, Phytologia 7: 63—66. 1959.

Recent collectors describe this plant as a large bush or shrub, 2—3 m. tall, with yellow flowers and orange fruit, growing in pastures, at 3—600 meters altitude, flowering in July, August, and December, and fruiting in November. Morton 4083 exhibits some leaves smooth and some hairy.

Additional citations: CUBA: Las Villas: R. A. Howard 5650 (W—1843985), 6629 (W—1959175); Morton 4083 (W—1783453). Oriente: Alain & López Figueiras 7173 (Bm); Ekman 1509 (W—2113455), 8019 (W—2113454); López Figueiras 1039 (W—2226623).

CITHAREXYLUM ULEI Moldenke

Additional bibliography: Moldenke, Phytologia 7: 66—68 (1959) and 13: 302. 1966.

Schultes describes the fruit of this plant as soft red, and states that it is used as bait for fish. He found it growing at 85 meters altitude, fruiting in March. A specimen of Ule 5501, deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, was photographed there by Macbride as his type photograph number 28399, but is not a type.

Additional citations: COLOMBIA: Putumayo: R. E. Schultes 3381 (W—1952755). BRAZIL: Amazonas: Ule 5501 [Macbride photos 28399] (W—photo).

CITHAREXYLUM ULEI var. CALVESCENS Moldenke

Additional bibliography: Moldenke, Phytologia 7: 68. 1959.

Additional citations: BRAZIL: Maranhão: Fróes 1719 (Mi—isotype).

CITHAREXYLUM WEBERBAUERI Hayek

Additional bibliography: Moldenke, Phytologia 7: 71—73. 1959; Soukup, Biota 3: 30. 1960; Moldenke, Phytologia 13: 303. 1966.

Angulo says of this plant "son venenosas" and records the common name "tantal". He found it growing at 2645 meters altitude. The type specimen, Weberbauer 3731, deposited in the herbarium of the Botanisches Museum at Berlin, was photographed there by Macbride as his type photograph number 17603, but is now destroyed. The Ellenberg 1946, distributed as C. weberbaueri, is actually C. quercifolium Hayek.

Additional citations: PERU: Huánuco: Weberbauer 3731 [Macbride photos 17603; Herb. U. S. Nat. Arb. 197893] (W—photo of type). La Libertad: Angulo 1267 (Z).

ADDITIONAL NOTES ON THE GENUS AEGIPHILA. XVII

Harold N. Moldenke

A complete list of the abbreviations employed by me for the names of herbaria in which cited specimens are deposited will be published shortly in this journal in my work on the genus Callicarpa. Meanwhile, most of them will be found explained in Phytologia 5: 154--159 (1955), 6: 242 (1958), 7: 91--92 (1959), 7: 123--124 (1960), 7: 343 (1961), 8: 95 (1961), 9: 191 (1963), and 12: 6 (1965).

AEGIPHILA Jacq.

Additional & emended synonymy: Aegiphila L. ex A. L. Juss., Gen. Pl., ed. 1, 107. 1789. Aegiphilla Briq. ex Moldenke, Résumé Suppl. 13: 6, in syn. 1966. Ageiphila Jacq., in herb.

Additional & emended bibliography: A. L. Juss., Gen. Pl., ed. 1, 107 (1789) and ed. 2, 120. 1791; L. C. Rich., Act. Soc. Hist. Nat. Paris 1: 106. 1792; Link, Enum. Pl. Berol. Alt. 1: 124. 1821; Spreng. in L., Syst. Veg., ed. 16, 1: 419 & 421 (1825) and 5: 126. 1828; Benth., Pl. Hartweg. 246. 1846; K. Schum. in Just, Bot. Jahresber. 28 (1): 495 & 496. 1902; Loes., Verh. Bot. Ver. Brand. 53: 81 [Abhandl. 246]. 1912; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1235 & 1253--1254. 1924; Robledo, Lecc. Bot. 2: 499. 1940; C. L. Lundell, Contrib. Univ. Mich. Herb. 8: 60, 75, 81--82, & 89. 1942; Moldenke, Biol. Abstr. 27: 2026. 1953; Moldenke, Verbenac. 24. 1955; Angely, Cat. Estat. Gen. Bot. Fan. 17: 2. 1956; Moldenke, Biol. Abstr. 30: 3551. 1956; Angely, Fl. Paran. 7: 4 & 11. 1957; Reitz, Sellowia 11: 49, 66, & 84. 1959; Moldenke, Biol. Abstr. 33: 1215 (1959) and 35: 2177. 1960; Angely, Liv. Cop. Bot. Bras. 35 & 37. 1960; Troncoso, Bol. Soc. Argent. Bot. 9: 181 & 185. 1961; Troncoso, Darwiniana 12: 260. 1961; Moldenke, Biol. Abstr. 36: 4036 (1961) and 37: 215 & 1062. 1962; Hocking, Excerpt. Bot. A.4: 224 & 593 (1962) and A.5: 44 & 537. 1962; Angely, Fl. Bacia Paran. 22: 39. 1962; Soukup, Biota 4: 81 & 191. 1962; Moldenke, Résumé Suppl. 10: 2. 1964; Angely, Bibl. Veg. Paran. 194. 1964; Reitz & Klein, Sellowia 16: 44, 55, 64, 103, & 108. 1964; Langman, Select. Guide Lit. Flow. Pl. Mex. 515, 748, & 1010. 1964; Gooding, Loveless, & Proctor, Fl. Barbados 354--355 & 463. 1965; Rambo, Pesquis. Bot. 21: 6--9, 58, & [59]. 1965; Moldenke, Phytologia 12: 6. 1965; Moldenke, Résumé Suppl. 12, 2, 3, & 9 (1965) and 13: 2, 3, & 6. 1966.

Soukup (1962) records the vernacular name "chirapa-sacha", a name applied also to Psychotria, Vernonia, and Wulffia. The J. F. Rock s.n. in the Bishop Museum herbarium, identified as Aegiphila sp. by C. Weurman at Leiden, is a species of Pisonia in the Pisoniaceae, while the Cuatrecasas 23088 is Petitia domingensis Jacq.

Recently Hatschbach has collected a strange plant in southern

Brazil which the late N. Y. Sandwith, at the Royal Botanic Gardens, Kew, felt is an Aegiphila. He says, in a letter to me dated August 3, 1964: "Today I examined it and in every flower the gynoecium was different, but the tiny, reduced tetramerous corolla with 4 stamens inserted near the top of the tube was always the same, at the bottom of the calyx. The gynoecium either shortly exceeded the corolla and ended in a weird, abnormal, club-shaped tip, or it was a long, spirally coiled, hairy organ ending in an empty inflated ovary terminated by a subulate undivided style! I cannot help feeling that this plant may, after all, be a new 'lusus' of an Aegiphila in the group of A. Sellowiana and A. verticillata: the foliage and indumentum are very suggestive indeed of these, & they are so common in S. Brazil. The inflorescence is surely essentially the same in character, but the pedicels are curiously elongated, the calyx is quite abnormal, & the reduced corolla and most gynoecium show every sign of abnormality. I have asked Dr. Hatschbach to watch this plant, to see if it occurs in a population or normal, healthy specimens of an Aegiphila, and if it is a 'unique' & perhaps inconstant."

AEGIPHILA ACULEIFERA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 456 (1961) and 8: 15. 1961; Moldenke, Biol. Abstr. 36: 4036 (1961) and 37: 1062. 1962.

Material of this plant has been misidentified and distributed in herbaria as A. odontophylla Donn. Sm., a species to which it is certainly very closely related.

Additional citations: COSTA RICA: Alajuela: A. F. Smith 110 [Stork 4210] (Mi). COLOMBIA: Cauca: Sneidern 1661 (W--2103663).

AEGIPHILA ALBA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 457. 1961.

Cazalet & Pennington describe this species as a tree, 40 feet tall, 8 inches in diameter at breast height, myrmecophilous, "the female flowers in axillary clusters; fruit a green acorn". They found it in a seasonal rainforest at 1000 feet altitude and identified it as "Aegiphila aff. valerii Standl." Eggers also describes it as a tree 40 feet tall, flowering in February. Játiva & Epling call it a "rounded tree", with "white cauline flowers", growing in forests and virgin forests at 700 meters altitude, flowering in July. Material of this species has been misidentified and distributed in herbaria as A. monstrosa Moldenke.

Additional citations: ECUADOR: Guayas: Eggers 14448 (A). Pichincha: Cazalet & Pennington 5090 (N); Játiva & Epling 354 (La--49645), 543 (La--49648, La--53199).

AEGIPHILA ANOMALA Pittier

Additional synonymy: Aegiphila anomala Pittier ex F. Miranda, Bol. Soc. Bot. Mex. 26: 160, sphalm. 1961.

Additional bibliography: F. Miranda, Bol. Soc. Bot. Mex. 26:

160 & 169. 1961; Moldenke, Phytologia 7: 457. 1961.

AEGIPHILA AUSTRALIS Moldenke

Additional bibliography: Moldenke, Phytologia 7: 458 (1961) and 8: 15. 1961; Rambo, Pesquis. Bot. 12: 21 (1961) and 21: 6 & [59]. 1965.

Rambo (1965) cites Herb. Anchieta 3334 [Sehnem s.n.] & 61186 from Santa Catarina, Brazil, and 11261 [Buck s.n.] from Rio Grande do Sul, the one not credited to someone else having been collected by himself. He calls the plant a "Small tree, up to 7 m high", growing in "Half-high woodlets, secondary growth" in the "Northwestern Highlands only" in Rio Grande do Sul, and gives its general distribution as "SC [Santa Catarina] and RGS [Rio Grande do Sul]".

AEGIPHILA BARBADENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 7: 458. 1961; Gooding, Loveless, & Proctor, Fl. Barbados 354 & 463. 1965.

AEGIPHILA BOGOTENSIS (Spreng.) Moldenke

Additional synonymy: Aegiphila bogotensis (H.B.K.) Moldenke, Prelim. Alph. List Invalid Names 1, in syn. 1940.

Additional bibliography: Moldenke, Phytologia 7: 458--459 (1961) and 8: 16. 1961.

Cuatrecasas and his associates describe this plant as a tree, 8--25 m. tall, the young branches ochraceous-ferruginous, the leaves flexible, rather dark and subcoriaceous or coriaceous and yellowish- or dark-green, shiny above, lighter beneath, the calyx greenish-ochraceous or ochraceous-ferruginous, the corolla white or greenish-white, flowering in October and November, with green fruit in February, growing in the Andean forest, among bushes, and on disturbed slopes, at 2700--3140 meters altitude. Steyermark records the vernacular name "yuco blanco".

Additional citations: COLOMBIA: Caldas: Killip 9811 (W--1142916). Cauca: Cuatrecasas & Willard 26466 (Fg). Cundinamarca: Garcia-Barriga 13341 (Ve--30779, W--1987600). Magdalena: Cuatrecasas & Castañeda 25219 (Z). Valle del Cauca: Cuatrecasas, Lopez Figueiras, & Willard 26817 (W--2455933). VENEZUELA: Lará: J. A. Steyermark 55265 (Ve--25826). Mérida: Garcia-Barriga 13294 (Ve). Táchira: Aristeguieta 2568 (Ve--39795, W--2248871).

AEGIPHILA BOGOTENSIS var. AEQUINOCTIALIS Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 27: 2026. 1953; Moldenke, Phytologia 7: 459. 1961.

AEGIPHILA BRACHIATA Vell.

Additional bibliography: Herter, Florul. Urug. 104. 1930; Herter, Revist. Sudam. Bot. 4: 185. 1937; Rambo, Sellowia 7: 207. 1956; Angely, Fl. Paran. 7: 11. 1957; Moldenke, Phytologia 8: 16. 1961; Rambo, Pesquis. Bot. 12: 21 (1961) and 21: 6--7 & [59]. 1965.

Bornmüller 581 is described as having had yellow flowers. The species has been found growing at altitudes of 50 to 900 meters, in woods, forests, forest margins, and ruderal. Material has been misidentified and distributed in herbaria as A. sellowiana Cham. and as Acnistus sp. The Sellow s.n., photographed by Macbride as his type photograph number 17590, was deposited in the herbarium of the Botanisches Museum at Berlin, but is now destroyed.

Rambo (1965) cites Herb. Anchieta 3979 from Uruguay, 1217, 6687, 9247, 26483 [Henz s.n.], 26508 [Henz s.n.], 28211, 29169, 31389 [Buck s.n.], 32840, 32928 [Friderichs s.n.], 32936 [Friderichs s.n.], 35579 [Vier s.n.], 37330, 44610, 48413 [Sehnem 2254], 48423 [Sehnem 2149], 50618 [Sehnem 3919], 57579 [Pivetta 657], 62045 [Camargo 1977], 62529 [Camargo 2284], 62539 [Camargo 2164], 62541 [Camargo 2088], 62546 [Camargo 2077], and 62565 [Camargo 2111] from Rio Grande do Sul, Brazil, all collected by himself except where otherwise designated. He describes the plant as "Recumbent, up to 10 m high", growing at "Edge of the rain forest, secondary forest, Campos woodlets"...."through the whole of the forested area" in Rio Grande do Sul, with a general distribution "From Rio de Janeiro and Paraguay down to RGS [Rio Grande do Sul] and Uruguay."

Additional citations: BRAZIL: Paraná: Curial 1052 (W—1951772); Hatschbach 6327 (W—2320786). Rio Grande do Sul: Bornmüller 345 (G), 581 (G); Sehnem 2149 (B). Santa Catarina: J. F. T. Müller s.n. [Rio Claro] (P); Smith & Klein 13233 (Ac); Smith & Reitz 12451 (Ac), 12759 (Ac). State undetermined: Sellow s.n. [Macbride photos 17590] (W—photo).

AEGIPHILA BRACTEOLOSA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 459—460. 1961.

Additional citations: BRAZIL: Amazonas: Ducke II.444 (W—1875380); Krukoff 5060 (W—1662821).

AEGIPHILA CANDELABRUM Briq.

Additional bibliography: Moldenke, Phytologia 7: 460—461 (1961) and 8: 16. 1961.

The Hassler 8120, photographed by Macbride as his type photograph number 24621, is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. Material of this species has been misidentified and distributed in herbaria under the name A. cuspidata Mart. & Schau. On the other hand, the Woolston 1046, distributed as A. candelabrum, is actually A. lanceolata Moldenke.

Additional citations: PARAGUAY: Hassler 7974 (Mi), 8120 [Macbride photos 24621] (W—photo of type).

AEGIPHILA CAUCENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 7: 461. 1961.

Woytkowski describes this plant as a scarce shrub, 3—4 meters tall, with very soft velvety leaves and pale-yellow flowers. He records the vernacular name "rupiñas" for it and notes "compare no. 5496", a collection which I have not as yet seen.

Additional citations: PERU: Junín: Woytkowski 6432 (Z).

AEGIPHILA CEPHALOPHORA Standl.

Additional bibliography: Moldenke, Phytologia 7: 461—462. 1961.

Additional citations: PANAMA: Barro Colorado Island: Shattuck 988 (W—2366733).

AEGIPHILA CHRYSANTHA Hayek

Additional bibliography: Moldenke, Phytologia 7: 462. 1961.

The Eggers 14348 photographed by Macbride as his type photograph number 20349 is deposited in the herbarium of the Botanisches Museum in Munich, while the Poeppig 2314 photographed by him as his type photograph number 34313 is deposited in the herbarium of the Naturhistorisches Museum at Vienna. Straw describes the plant as a small tree, 3 meters tall, with greenish flowers ("but past flowering"), growing in partial shade near a river on open and grazed selva in Loreto.

Additional citations: ECUADOR: Guayas: Eggers 14348 [Macbride photos 20349] (N—photo). Manabi: Eggers 14838 (W—1618703, W—1618777). PERU: Loreto: Poeppig 2314 [Macbride photos 34313] (W—photo); Straw 2426 (W—2451475). MOUNTED CLIPPINGS: Hayek in Engl., Bot. Jahrb. 42: 171—172. 1909 (W).

AEGIPHILA CONTURBATA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 462. 1961.

The Newman s.n. specimen photographed by Macbride as his type photograph number 28377 is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva.

Additional citations: BRAZIL: Maranhão: Newman s.n. [Macbride photos 28377] (W—photo of type).

AEGIPHILA CORDATA Poepp.

Additional bibliography: Moldenke, Phytologia 7: 462—463. (1961) and 8: 16. 1961.

The Poeppig 2158 specimen photographed by Macbride as his type photograph number 34312 is deposited in the herbarium of the Naturhistorisches Museum at Vienna.

Additional citations: PERU: Junín: Woytkowski 5977 (W—2453096). Loreto: Poeppig 2158 [Macbride photos 34312] (W—photo of type).

AEGIPHILA CORDIFOLIA (Ruíz & Pav.) Moldenke

Additional bibliography: Spreng. in L., Syst. Veg., ed. 16, 1: 421 (1825) and 5: 126. 1828; Moldenke, Phytologia 7: 463. 1961.

The specimen of Ruíz & Pavon s.n. photographed by Macbride as his type photograph number 28378 is deposited in the Delessert

Herbarium at the Conservatoire et Jardin Botaniques in Geneva.

Additional citations: PERU: Huánuco: Ruíz & Pavon s.n. [Mifia; Macbride photos 28378] (W--photo of isotype).

AEGIPHILA COSTARICENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 7: 463--464. 1961; Moldenke, Résumé Suppl. 13: 2. 1966.

Matuda found this species in flower in November. Steyermark describes it as a tree, 5 meters tall, with membranous leaves that are rich-green above and white flowers, blooming in March, growing along rocky stream-beds at 750--900 meters altitude.

Additional citations: MEXICO: Chiapas: Matuda 572 (Ld), 6152 (Ld). VENEZUELA: Carabobo: J. A. Steyermark 94313 (Z), 95242 (Ac).

AEGIPHILA CRENATA Moldenke

Additional bibliography: Angely, Fl. Paran. 7: 6 & 11. 1957; Moldenke, Phytologia 7: 464 (1961) and 8: 16. 1961.

The specimen of Dusén 10541, photographed by Macbride as his type photograph number 30182, is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva.

Additional citations: BRAZIL: Paraná: Dusén 10541 [Macbride photos 30182] (W--photo of isotype).

AEGIPHILA CUNEATA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 464 & 467. 1961; Moldenke, Biol. Abstr. 36: 4036 (1961) and 37: 215. 1962; Moldenke, Résumé Suppl. 10: 2. 1964.

Grubb and his associates describe this species as an undergrowth bush, to 3 m. tall, with a flattish crown, the young apices of the branches covered with mauve hairs, the flowers white, blooming in September, and growing at 1450 feet altitude.

Additional citations: ECUADOR: Napo-Pastaza: Grubb, Lloyd, Pennington, & Whitmore 1658 (N, N).

AEGIPHILA CUNEATA var. HIRSUTISSIMA Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 27: 2026. 1953; Moldenke, Phytologia 7: 467. 1961.

AEGIPHILA DEPPEANA Steud.

Additional bibliography: Loes., Verh. Bot. Ver. Brand. 53: 81 [Abhandl. 246]. 1912; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1253--1254. 1924; Moldenke, Phytologia 7: 467--468. 1961.

Additional citations: MEXICO: Oaxaca: Martínez-Calderón 418 (Rf). COLOMBIA: Atlántico: Elias 1621 (W--1731841). Magdalena: H. H. Smith 881 (Mi, S), 1864 (Mi).

AEGIPHILA ELATA Sw.

Additional synonymy: Aegophila elata Sw. ex Hocking, Dict. Terms Pharmacog. 6, sphalm. 1955.

Additional bibliography: C. L. Lundell, Contrib. Univ. Mich.

Herb. 8: 60. 1942; Hocking, Dict. Terms Pharmacog. 6. 1955; Moldenke, Phytologia 7: 468—469. 1961; Gooding, Loveless, & Proctor, Fl. Barbados 354, 355, & 463. 1965; Moldenke, Résumé Suppl. 13: 2. 1966.

Recent collectors describe this plant as a shrub or arching shrub, 2—4 m. tall, a small tree, or a woody vine or liana, often semi-climbing, the stems 1 inch in diameter; leaves papery or subcoriaceous, dull or slightly glossy and medium- or deep-green above, dull and paler beneath; calyx green; flowers cream-color, creamish, yellow, greenish-yellow, or light-yellow; fruit obovoid, vermillion-orange, 1.2—1.5 cm. long, about 8 mm. wide. It has been found growing along roadsides in secondary forests and on broken ridges, in thickets on steep hillsides, and in secondary growth on banks of small rivers, at altitudes of 350 to 1250 m., flowering in March, April, July, and August, fruiting in August. The flowers are described as "cream" on Lasser & Vareschi 4047, "creamish" on Gentle 4457, "light-yellow" on J. V. Santos 2926, and "yellow" on Aristeguieta & Pannier 1856. Lundell (1942) cites Matuda 3031, 3081, & 3406.

Additional citations: MEXICO: Oaxaca: J. V. Santos 2926 (Mi). Vera Cruz: J. V. Santos 2315 (Mi). GUATEMALA: El Petén: Contreras 3259 (Ld), 3374 (Ld, S). BRITISH HONDURAS: Gentle 4456 (Rf), 4457 (Rf, Rf), 6752 (Ld, S), 7726 (Ld), 8009 (Ld, S). JAMAICA: G. R. Proctor 23913 (Mi). VENEZUELA: Barinas: Breteler 3735 (N). Bolívar: J. A. Steyermark 86729 (Ve). Monagas: Lasser & Vareschi 4047 (Ve—38255). Yaracuy: Aristeguieta & Pannier 1856 (Ve—34289).

AEGIPHILA ELEGANS Moldenke

Additional bibliography: Moldenke, Phytologia 7: 469. 1961; Moldenke, Résumé Suppl. 12: 3. 1965.

Asplund 8935 seems to be a mixture with Cornutia odorata (Poepp. & Endl.) Poepp. — the Stockholm herbarium sheet is Cornutia, but the United States National Herbarium sheet is Aegiphila, although distributed as Cornutia.

Additional citations: ECUADOR: Napo-Pastaza: Asplund 8935, in part (W—2224015).

AEGIPHILA FARINOSA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 470. 1961.

The species has been collected in fruit in January.

Additional citations: COLOMBIA: Valle del Cauca: López Figueiras 8307 (W—2455215).

AEGIPHILA FENDLERI Moldenke

Additional bibliography: Moldenke, Phytologia 7: 471. 1961.

Steyermark describes this plant as "vining"; leaves subcoriaceous, deep dull-green above, fulvous-green beneath; calyx greenish; corolla creamy-yellow, growing at 1300—1400 m. altitude,

flowering in October.

Additional citations: VENEZUELA: Aragua: H. Pittier 14982 (W--1832690); J. A. Steyermark 89931 (Z); Tamayo 1643 (W--1833098). BRAZIL: Amapá: Murça Pires, Rodrigues, & Irvine 50394 (N).

AEGIPHILA FERRUGINEA Hayek & Spruce

Additional bibliography: Moldenke, Phytologia 7: 471. 1961.

The specimen of Spruce 5473, photographed by Macbride as his type photograph number 34311, is deposited in the herbarium of the Naturhistorisches Museum at Vienna.

Additional citations: ECUADOR: Chimborazo: Rimbach 616 [Herb. Mus. Yale School Forest. 31994] (W--1742057). Pichincha: Asplund 6456 (W--2223762); Spruce 5473 [Macbride photos 34311] (W--photo of type).

AEGIPHILA FILIPES Mart. & Schau.

Additional bibliography: K. Schum. in Just, Bot. Jahresber. 28 (1): 495. 1902; Moldenke, Phytologia 7: 471--472. 1961; Soukup, Biota 4: 81. 1962.

Soukup (1962) records for this plant the vernacular name "chirarapa-sacha", a name, however, which is also applied to species of Psychotria, Vernonia, and Wulffia. Material has been misidentified and distributed in herbaria as A. martinicensis Jacq. The specimen of Martius s.n., photographed by Macbride as his type photograph number 20350, is deposited in the herbarium of the Botanisches Museum at Munich.

Additional citations: COLOMBIA: Magdalena: H. H. Smith 1831 (Mi). BRAZIL: Amazonas: Krukoff 5125 (W--1662846). Pará: Martius s.n. [Macbride photos 20350] (N--photo of cotype).

AEGIPHILA FLORIBUNDA Moritz & Moldenke

Additional bibliography: Moldenke, Phytologia 7: 472. 1961.

The specimen of Moritz 1765, photographed by Macbride as his type photograph number 34310, is deposited in the herbarium of the Naturhistorisches Museum at Vienna.

Additional citations: VENEZUELA: Aragua: Moritz 1765 [Macbride photos 34310] (W--photo).

AEGIPHILA FLUMINENSIS Vell.

Additional bibliography: Angely, Fl. Paran. 7: 11. 1957; Moldenke, Phytologia 8: 16. 1961.

The flowers are described as "cream" on Hatschbach 6616 and as "whitish" on Glaziou 3067. The plant has been found growing "em terrenos baldios" by Hatschbach. It has been collected in anthesis in November and December. The specific name is sometimes uppercased.

Additional citations: BRAZIL: Paraná: Hatschbach 6616 (W--2321465). Rio de Janeiro: Glaziou 3067 (Ja--11193).

AEGIPHILA GLABRATA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 473. 1961.

Wurdack describes this plant as a woody vine, climbing 5—7 m., with white flowers, occasional in rainforest on middle north slopes, at 550—750 m. altitude, blooming in October.

Additional citations: PERU: Loreto: Wurdack 2390 (W—2403697).

AEGIPHILA GLANDULIFERA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 473. 1961.

This plant has been found growing at 1200 m. altitude. The Lasser 905, distributed as this species, is actually A. mollis H.B.K.

Additional citations: VENEZUELA: Yaracuy: Aristeguieta & Foldats 1451 (Ve—33507). BRAZIL: Pará: Archer 8051 (W—2439039).

AEGIPHILA GLANDULIFERA var. PARAËNSIS Moldenke

Additional bibliography: Moldenke, Phytologia 7: 473—474. 1961.

Additional citations: BRAZIL: Amapá: Murça Pires, Rodrigues, & Irvine 51052 (N).

AEGIPHILA GLOMERATA Benth.

Additional & emended bibliography: Benth., Bot. Voy. Sulphur 154. 1846; Moldenke, Phytologia 7: 474—475. 1961.

AEGIPHILA GRANDIS Moldenke

Additional bibliography: Moldenke, Phytologia 7: 475—476. 1961.

Lasser describes this species as a tree, 10 m. tall, with a columnar trunk, irregular crown, and very fragrant flowers. He records the vernacular name "oreja de burro". The specimen of Triana 2080 photographed by Macbride as his type photograph number 28379 is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva.

Additional citations: COLOMBIA: Cundinamarca: Triana 2080 [Macbride photos 28379] (W—photo). VENEZUELA: Bolívar: Lasser 1167 (Ve).

AEGIPHILA GRAVEOLENS Mart. & Schau.

Additional bibliography: Moldenke, Phytologia 7: 476. 1961.

The specimen of Lund 796 photographed by Macbride as his type photograph number 7880 is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. The species has been found in anthesis in June. Material has been misidentified and distributed in herbaria as Solanum sp.

Additional citations: BRAZIL: Bahía: Duarte 6847 [Herb. Brad. 24404] (W—2436357). São Paulo: Lund 796 [Macbride photos 7880] (N—photo of type, W—photo of type).

AEGIPHILA GUIANENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 7: 476. 1961.

The specimen of Triana 2084 photographed by Macbride as his type photograph number 28380 is deposited in the Delessert Herbar-

ium at the Conservatoire et Jardin Botaniques in Geneva,

Additional citations: COLOMBIA: Cundinamarca: Triana 2084 [Macbride photos 28380] (W--photo). VENEZUELA: Guárico: Aristeguieta 4215 (Ve--46119).

AEGIPHILA HASSLERI Briq.

Additional synonymy: Aegiphila hassleri Chod. ex Moldenke, Résumé Suppl. 3: 29, in syn. 1962; Rambo, Pesquis. Bot. 21: 7 & [59]. 1965.

Additional bibliography: Rambo, Sellowia 7: 207. 1956; Angely, Fl. Paran. 7: 11. 1957; Moldenke, Phytologia 8: 16. 1961; Rambo, Pesquis. Bot. 21: 7 & [59]. 1965; Moldenke, Résumé Suppl. 13: 3. 1966.

The specimens of Hassler 3193 photographed by Macbride as his type photograph number 24613 are deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva. Smith & Reitz found the species growing in forests and low woods, as well as on moist banks, at 150--750 m. altitude, fruiting in October. Material has been misidentified and distributed in herbaria under the name Citharexylon sp. The Del Puerto 3234, cited below, bears a notation "Corresponde a muestra No. 4166", a specimen not as yet seen by me.

Rambo (1965) cites Herb. Anchieta 990 & 49952 from Santa Catarina, 11251, 40014, 45761, 49479, 54254 [Emrich s.n.], 60845 [Camargo 1438], & 62037 [Camargo 2037] from Rio Grande do Sul, Brazil, all collected by himself except where otherwise designated. He calls the plant a "Small tree, up to 7 m high", growing at the "Edge of the forest, secondary growth", in Rio Grande do Sul, "Apparently northern forested area only", with a general distribution "From Paraná and Paraguay through South Brazil and Argentina Mesopotamia to RGS [Rio Grande do Sul] and Uruguay".

Additional citations: BRAZIL: Santa Catarina: Smith & Reitz 12694 (Ac), 12751 (Ac). PARAGUAY: Hassler 3193 [Macbride photos 24613] (W--photo of cotype). URUGUAY: Del Puerto 3234 (Z). ARGENTINA: Misiones: Montes 121 (W--2049836).

AEGIPHILA HERZOGII Moldenke

Additional bibliography: Moldenke, Phytologia 7: 477. 1961.

The specimen of Herzog 1369 photographed by Macbride as his type photograph number 28381 is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva.

Additional citations: BOLIVIA: Santa Cruz: Herzog 1369 [Macbride photos 28381] (W--photo of isotype).

AEGIPHILA HIRSUTISSIMA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 478. 1961.

The Burkart 17014, distributed as this species, is actually A. mollis H.B.K.

Additional citations: COLOMBIA: Bolívar: F. W. Pennell 4563 (W-1043141).

AEGIPHILA INTEGRIFOLIA (Jacq.) Jacks.

Additional synonymy: Callicarpa foliis ovatis acutis integerrimis, subtus subtomentosis, racemis densis axillaribus et terminalibus, tubo corollae calyce quadruplo longiore Willd., Linn. Sp. Pl. 1: 621, in syn. 1797. Callicarpa (integrifolia) foliis integerrimis Jacq. ex Willd., Linn. Sp. Pl. 1: 621, in syn. 1797.

Additional bibliography: Willd., Linn. Sp. Pl. 1: 621. 1797; Spreng. in L., Syst. Veg., ed. 16, 1: 419 & 421. 1825; J. A. & J. H. Schultes, Mant. 3: 50 & 51. 1827; Spreng. in L., Syst. Veg., ed. 16, 5: 126. 1828; Stapf, Ind. Lond. 1: 526. 1929; Moldenke, Phytologia 7: 479--480. 1961; Tamayo, Bol. Soc. Venez. Cienc. Nat. 22: 127 & 165. 1961.

Additional illustrations: Jacq., Sel. Stirp. Amer. Hist. pl. 173, fig. 7. 1763; Jacq., Sel. Stirp. Amer. Hist. Picta pl. 259, fig. 6 [in color]. 1780.

McCarroll describes the fruit of this species as red. The plant has been found in anthesis in January and in fruit in April. An additional common name is "ganzblättrige Schönbeere". The Borsotti 53 and Ll. Williams 13401, distributed as this species, are actually A. parviflora Moldenke, Lasser 1167 is A. sessiliflora Moldenke, and Sehnem 3781 is not verbenaceous.

Sprengel (1825) and Schultes (1827) place this taxon in the synonymy of the North American Callicarpa americana L., a palpable error.

Additional citations: COLOMBIA: Boyacá: Lawrance 548 (W--2324023). VENEZUELA: Amazonas: Ll. Williams 14533 (W--1564616), 15080 (W--1877412). Anzoátegui: Aristeguieta & Agostini 4714 (N). Aragua: Agostini & Fariñas 107 (B). Bolívar: H. M. Curran 26 (Ve--41363); Lasser 1291 (Ve), 1604 (Ve); Tamayo s.n. [Sta. Elena, Marzo 1946] (Ve). Mérida: E. L. Little 16209 (Ve). Monagas: Aristeguieta 3916 (Ve--44562). State undetermined: Tamayo 2982 (Ve--27077). BRITISH GUIANA: Tutin 59 (W--1743381). ECUADOR: Napo-Pastaza: Asplund 8868 (W--2224005), 10166 (W--2224188); Mexia 7173 (W--1663739), 7187 (W--1663747), 7289 (W--1663799). PERU: Cuzco: Vargas Calderón 7385 (W--1995360). Loreto: O. V. Nuñez 2449 (W--2121593); Schunke 343 (W--1459230). Puno: McCarroll 94 (Mi), 131 (Mi). BRAZIL: Amapá: Irwin, Egler, & Murça Pires 47161 (N).

AEGIPHILA INTERMEDIA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 480. 1961; Moldenke, Résumé Suppl. 12: 2. 1965.

It should be noted here that some of the leaves on Ll. Williams 13174, cited below, greatly resemble those of A. integrifolia (Jacq.) Jacks. The specimen of Herb. Gen. Mus. Para. 2270 photographed by Macbride as his type photograph number 28382 is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva.

Additional citations: VENEZUELA: El Ratón Island [Amazonas]: Ll. Williams 13174 (W--2428869). BRAZIL: Maranhão: Herb. Gen. Mus. Para. 2270 [Macbride photos 28382] (W--photo of isotype).

AEGIPHILA LAETA H.B.K.

Additional bibliography: Moldenke, Phytologia 7: 481. 1961.

Material of this species has been misidentified and distributed in herbaria as Callicarpa sp. On the other hand, the Duke 4555, distributed as Aegiphila laeta, is not verbenaceous.

Additional citations: PANAMA: Darien: Duke 4116 (Z). VENEZUELA: Zulia: Mocquerys 1018 (W--2383053).

AEGIPHILA LAEVIS (Aubl.) Gmel.

Additional & emended bibliography: Hayek in Engl., Bot. Jahrb. 42: 172. 1908; Moldenke, Phytologia 7: 481--482. 1961.

Kramer & Hekking describe this plant as follows: "a shrub a few meters tall; leaves chartaceous, bearing green glands beneath near the base of the lamina; corolla infundibuliform with patent limb, very pale greenish yellow, almost white, very fragrant; style concolorous, long-exserted, furcate; anthers brown", flowering in January.

The Feddema 2001, distributed as A. laevis, seems to be a species of Pisonia or some related genus.

Additional citations: SURINAM: Kramer & Hekking 2746 (N).

AEGIPHILA LANATA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 482. 1961.

The specimen of Glaziou 21917 photographed by Macbride as his type photograph number 28383 is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva.

Additional citations: BRAZIL: Brasilia: Heringer 7323/17 (N), 7823 (N). Goiás: Cobra & Oliveira 244 (Z); Cobra & Sucre 309 (Ac); Glaziou 21917 [Macbride photos 28383] (W--photo of isotype).

AEGIPHILA LANCEOLATA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 482--483 (1961) and 13: 321. 1966.

Woolston describes this plant as follows: "Woody climber, 10 m. x 10 cm. diam. at base, with fairly close branches at extremities; stem pale grayish-brown with reticulate fine lines; on trees in wer woodlands; corolla yellow, quickly falling; filaments white; anthers brown; style white; calyx & peduncles pale yellowy-green; leaves dark yellow-green, with slight sheen; midrib and lower surface very pale; branchlets pale yellow-green". Material has been misidentified and distributed in herbaria as A. candelabrum Briq.

Additional citations: BRAZIL: Minas Gerais: Heringer 6371 (Z). PARAGUAY: Woolston 1046 (W--2281654).

AEGIPHILA LAXICUPULIS Moldenke

Additional bibliography: Moldenke, Phytologia 7: 483. 1961.

This species has been found growing at 600 feet altitude by Allen & Severen, misidentified and distributed in herbaria as A. martinicensis Jacq.

Additional citations: EL SALVADOR: San Miguel: Allen & Severen 6894 (W—2366499).

AEGIPHILA LAXIFLORA Benth.

Additional bibliography: Moldenke, Verbenac. 29—30. 1955; Moldenke, Phytologia 7: 483. 1961.

The specimen of M. R. Schomburgk 772 photographed by Macbride as his type photograph number 28384 is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva.

Additional citations: VENEZUELA: Bolívar: J. A. Steyermark 57719 (Ve—26393). Monagas: J. A. Steyermark 62242 (Ve—36230). BRITISH GUIANA: M. R. Schomburgk 772 [Macbride photos 28384] (W—photo of isotype).

AEGIPHILA LEHMANNII Moldenke

Additional bibliography: Moldenke, Phytologia 7: 483—484. 1961.

The specimen of Triana 2083 photographed by Macbride as his type photograph number 28385 is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva.

Additional citations: COLOMBIA: Boyacá: Lawrance 156 (W—2323888). Cauca: Sneidern 1660 (W—2103662). Chocó: Triana 2083, in part [Macbride photos 28385] (W—photo).

AEGIPHILA LEWISIANA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 484. 1961.

The fruit of this species is decidedly round, hard, woody, and not at all wrinkled, tetragonal, or fleshy when dried.

Additional citations: VENEZUELA: Carabobo: J. A. Steyermark 94357 (Z).

AEGIPHILA LHOTZKIANA Cham.

Additional bibliography: Angely, Fl. Paran. 7: 11. 1957; Moldenke, Phytologia 8: 16. 1961.

The specimen of Casaretto 2022 photographed by Macbride as his type photograph number 24614 is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva, while the Sellow s.n. [Brasilia] photographed by him as his type photograph number 17585 was deposited in the herbarium of the Botanisches Museum in Berlin, but is now destroyed. The Eitens found this species in "degraded cerrado; young barbatimão, trees and shoots 1—3 m. tall, spaced 2—5 m. apart; ground recently burned; shrub 1.5—2 m. tall, thin, erect, unbranched until the top", flowering in October.

Additional citations: BRAZIL: Amapá: Murça Pires, Rodrigues, & Irvine 51116 (N). Bahia: Casaretto 2002 [Macbride photos 24614]

(W--photo). São Paulo: Eiten & Eiten 2435 [from plant 6] (N), 2435 [from plant 7] (W--2371219); Mattos & Mattos 8418 (W--2445192); Mimura 23 (N), 49 (N), 216 (W--2445188). State undetermined: Sellow s.n. [Brasilia; Macbride photos 17585] (W--photo of type).

AEGIPHILA LONGIFOLIA Turcz.

Additional & emended bibliography: Turcz., Bull. Soc. Nat. Mosc. 36 (2): 218--219. 1863; Moldenke, Phytologia 7: 484. 1961.

The specimen of Schlim 688 photographed by Macbride as his type photograph number 24616 is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva.

Turczaninow (1863) describes this plant as follows: "Ae. ramis, petiolis, paginae inferioris foliorum costa atque panicula patentim pilosis; foliis breviter petiolatis basi obtusis in petiolum brevissime decurrentibus, oblongo-lanceolatis longe acuminatis integerrimis, supra fere glabris; paniculae terminalis, folia parum superantis pedunculo ad medium refracto; cymis oppositis numerosis, inferioribus deflexis; bracteis ovatis vel spathulatis acuminatis deciduis, bracteolis seraceis; calyce turbinato truncato edentulo; corollae (adhuc inapertae) tubo calycem vix excedente. Flores a schedula lutescentes."

Additional citations: COLOMBIA: Santander: Schlim 688 [Macbride photos 24616] (W--photo of isotype).

AEGIPHILA LUSCHNATHI Schau.

Additional bibliography: Moldenke, Phytologia 7: 485. 1961.

The specimen of Luschnath s.n. [Herb. Martius 1040] photographed by Macbride as his type photograph number 7879 is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva.

Additional citations: BRAZIL: Rio de Janeiro: Luschnath s.n. [Herb. Martius 1040; Macbride photos 7879] (W--photo of cotype); Miers 3712 (W--2383081).

AEGIPHILA MACRANTHA Ducke

Additional bibliography: Moldenke, Phytologia 7: 485--486. 1961.

Steyermark describes this species as a woody vine, vining shrub, or high-climbing liana, the leaves subcoriaceous, rich-green above, pale-green beneath with raised veins, corolla buff-cream, fruiting-calyx brown, fruit dull-green, turning yellow, growing at altitudes of 250 to 800 meters, flowering in August, fruiting in December. Material has been misidentifed and distributed in herbaria as A. perplexa Moldenke.

Additional citations: VENEZUELA: Bolívar: J. A. Steyermark 86660 (Ve), 88157 (N). Miranda: J. A. Steyermark 89365 (Mi). BRITISH GUIANA: Sandwith 1202 (W--1858935). BRAZIL: Pará: Ducke 843 (W--1875670).

AEGIPHILA MARTINICENSIS Jacq.

Additional synonymy: Aegyphila martinicensis DC. ex Moldenke, Ré-

sumé Suppl. 13: 6, in syn. 1966. Aegyphila martinicensis Jacq. ex Moldenke, Résumé Suppl. 13: 6, in syn. 1966.

Additional & emended bibliography: L. C. Rich., Act. Soc. Hist. Nat. Paris 1: 106. 1792; W. T. Ait., Hort. Kew., ed. 2, 1: 264. 1810; Link, Enum. Pl. Berol. Alt. 1: 124. 1821; Robledo, Lecc. Bot. 2: 499. 1940; Moldenke, Phytologia 7: 486—488. 1961; Soukup, Biota 4: 81. 1962; Gooding, Loveless, & Proctor, Fl. Barbados 354, 355, & 463. 1965; Moldenke, Résumé Suppl. 13: 6. 1966; Moldenke, Phytologia 13: 325 & 330. 1966.

Recent collectors describe this plant as a shrub, arching shrub, or small scraggly tree, 5—15 feet tall, with white or whitish flowers and orange fruit, growing in cracks of stone walls, in mossy forests on northern ridges, or "common" in woodlands, sometimes where the rainfall is 500—903 cm., at altitudes of 10--1300 meters, flowering in January, August, September, and November, fruiting in February and April. The common name "bois amé" [meaning, bitter shrub] is recorded for it on Dominica and "bois cabrit" in Guadeloupe. Material has been misidentified and distributed in herbaria as Callicarpa sp. On the other hand, the Allen & Severen 6894, distributed as A. martinicensis, is actually A. laxicupulis Moldenke, while H. H. Smith 868 is A. mollis H. B.K. and H. H. Smith 1831 is A. filipes Mart. & Schau. The flowers on Webster, Ellis, & Miller 9198 are described as "whitish", but on R. A. Howard 11158 as "white".

Additional citations: PANAMA: Canal Zone: Duke 4685 (Ca). Darien: Duke 4114 (E). PUERTO RICO: Alain 10300 (G, Ij, N, Sj); Otero 270 (Mi), 308 (Mi). LEEWARD ISLANDS: Dominica: W. H. Hodge 1320 (G), 3093 (G), 3824 (G); Hodge & Hodge 1258 (G), 1496 (G), 1631 (G), 2073 (G), 2572 (G), 2802 (G), 2813 (G), 2948 (G), 3077 (G); Stehlé & Stehlé 6329 (W—2453676). Guadeloupe: H. Stehlé 2813 (W—2453662); Stehlé & Stehlé 7079 (W—2453682); Webster, Ellis, & Miller 9110 (Mi). WINDWARD ISLANDS: Grenada: Hunnewell 19279 (Rf). Martinique: H. Stehlé 2393 (W—2453694); Stehlé & Stehlé 4939 (W—2453699); Webster, Ellis, & Miller 9198 (Mi). Saint Lucia: R. S. Cowan 1571 (N). Saint Vincent: R. A. Howard 11158 (Mi). VENEZUELA: Zulia: Mocquerys 910 (W—2383052).

AEGIPHILA MARTINICENSIS var. OLIGONEURA (Urb.) Moldenke

Additional bibliography: Moldenke, Phytologia 7: 488. 1961.

W. T. Stearn regards this taxon as a valid species. He says that W. Harris 11716, identified by me as A. swartziana Urb., is really representative of the female-predominant form of A. oligoneura Urb.

AEGIPHILA MEDITERRANEA Vell.

Additional bibliography: Moldenke, Phytologia 7: 488. 1961.

Glaziou 1546 is said to have been taken from a shrub with "whitish" corollas. Rodriguez 457 has calyx-teeth that are not

long-cuspidate nor setaceous-tipped like those on most of the Rio de Janeiro specimens — it was misidentified as Cordia sellowiana Cham. and distributed as such in herbaria. An isotype of A. cestrifolia Gardn., deposited in the herbarium of the Naturhistorisches Museum at Vienna, was photographed there by Macbride as his type photograph number 34358.

Additional citations: BRAZIL: Rio de Janeiro: G. Gardner 100 [Macbride photos 34358] (W--photo); Glaziou 1546 (Ja--11192). State undetermined: Ramiz Galvao s.n. [Rio Comprido] (P). ARGENTINA: Misiones: Rodriguez 457 [Herb. Inst. Miguel Lillo 57251] (G).

AEGIPHILA MEMBRANACEA Turcz.

Additional bibliography: Moldenke, Phytologia 8: 16. 1961.

An isotype of this species, Hostmann 89, deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva, was photographed by Macbride as his type photograph number 24617. The H. Pittier 15481, distributed as A. membranacea, is actually A. quinduensis (H.B.K.) Moldenke.

Additional citations: VENEZUELA: Bolívar: Steyermark & Nilsson 193 (N). SURINAM: Hostmann 89 [Macbride photos 24617] (W--photo of isotype).

AEGIPHILA MOLLIS H.B.K.

Additional synonymy: Aegiphila mollis Humb. & Bonpl. ex Steud., Nom. Bot., ed. 1, 1: 16. 1821. Aegiphila mutisii Humb. & Bonpl. ex Steud., Nom. Bot., ed. 1, 1: 16. 1821. Aegiphila salutaris Humb. & Bonpl. ex Steud., Nom. Bot., ed. 1, 1: 16. 1821. Aegiphila mollis Bonpl. ex Spreng. in L., Syst. Veg., ed. 16, 1: 422. 1825. Aegiphila mutisii Bonpl. ex Spreng. in L., Syst. Veg., ed. 16, 1: 422. 1825. Aegiphila salutaris Bonpl. ex Spreng. in L., Syst. Veg., ed. 16, 1: 422. 1825. Aegiphila salutaris Humb. & Kunth ex Benth., Ann. Nat. Hist. 2: 449. 1839. Aegiphila mutisii Humb. & Kunth ex Benth., Fl. Hartw. 246. 1846. Aegiphila mollis Kunth ex Schau. in A. DC., Prodr. 11: 654. 1847. Aegiphila mutisii Kunth ex Schau. in A. DC., Prodr. 11: 654. 1847. Aegiphila salutaris Kunth ex Schau. in A. DC., Prodr. 11: 654. 1847. Aegiphyla mollis H.B.K. ex Moldenke, Résumé Suppl. 6: 9, in syn. 1963.

Additional bibliography: Benth., Pl. Hartw. 246. 1846; Moldenke, Phytologia 7: 489--490 (1961) and 13: 326, 327, & 332. 1966.

Burkart 17014 is of the "mutisii" type, with dense spreading pubescence, and is said to have had "yellowish-white" corollas, while Lasser 905 had "yellow" corollas; the flowers on Aristeguieta 6164 were "white". Pannier & Schwabe s.n. exhibits one branch with ternate leaves.

An isotype of A. salutaris in the herbarium of the Botanisches Museum at Berlin was photographed there by Macbride as his type photograph number 17588, but is now destroyed; similarly, the type

of Cornutia velutina, in the same herbarium, was photographed by him as his type photograph number 17568 and is now also destroyed. It is possible that the Humboldt XII, with no definite locality of collection indicated, and also deposited in the Berlin herbarium and photographed there by Macbride as his type photograph number 17586, may have been the actual type of A. mollis, but it is also now destroyed.

Material of A. mollis has been misidentified and distributed in herbaria as A. glandulifera Moldenke, A. hirsutissima Moldenke, A. martinicensis Jacq., and A. mollis var. intermedia Moldenke. On the other hand, the Elias 1458 and Haught 3738, distributed as A. mollis, are actually var. intermedia.

Additional citations: COLOMBIA: Cauca: F. C. Lehmann 6692 [Macbride photos 17568] (W--photo). Magdalena: H. H. Smith 868 (Mi), 870 (Mi), 1860 (Mi). VENEZUELA: Amazonas: Humboldt 983 [Herb. Willdenow 2834; Macbride photos 17588] (W--photo); Pannier & Schwabe s.n. [Ledio y Alto Orinoco] (Ve). Aragua: Burkart 17014 (Ve); Lasser 905 (W--1879925). Guárico: Aristeguieta 4249 (Ve--46833), 6164 (Z); Aristeguieta & Hernández 2307 (Ve--37286). Mérida: J. A. Steyermark 56314 (Ve--25827). Yaracuy: Aristeguieta & Pannier 1803 (Ve--34309). State undetermined: Humboldt XII [Herb. Willdenow 2838; Macbride photos 17586] (W--photo).

AEGIPHILA MOLLIS var. INTERMEDIA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 490. 1961.

Material of this variety has been misidentified and distributed in herbaria as typical A. mollis H.B.K. On the other hand, the H. H. Smith 870, distributed in some herbaria as A. mollis var. intermedia, is actually typical A. mollis.

Additional citations: COLOMBIA: Atlántico: Elias 1458 (W--1594641). Magdalena: Haught 3738 (W--1708553).

AEGIPHILA MONSTROSA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 490 (1961) and 13: 319. 1966.

Steyermark refers to this plant as a small tree, 25 feet tall, with pale olive-green leaves; Contreras found it in ramonal bordering a lake; Lundell calls it an arborescent shrub or small tree, 25 feet tall, the trunk 3 inches in diameter, growing on hillsides and on a temple in ramonal covering ancient ruins; while Gentle says that the trunk is 5 inches in diameter and the flowers are white and scented, growing on creeksides, in acahual, and on wild coffee ridges — he records the vernacular names "hullub" and "ruxsain".

Additional citations: GUATEMALA: El Petén: Contreras 1656 (Ld, S); C. L. Lundell 15443 (Ld, S), 15464 (Ld), 15831 (Ld, S). Izabal: J. A. Steyermark 42011 (Rf). BRITISH HONDURAS: Gentle 5078 (Ld), 6900 (Ld), 7548 (Ld), 9042 (Ld).

AEGIPHILA MULTIFLORA Ruíz & Pav.

Additional bibliography: K. Schum. in Just, Bot. Jahresber. 28 (1): 496. 1902; Moldenke, Holmbergia 4: 148. 1945; Soukup, Biota 1: 180—181. 1956; Moldenke, Phytologia 7: 491. 1961.

A specimen of Ruíz 187, originally deposited in the herbarium of the Botanisches Museum at Berlin, but now destroyed, was photographed there by Macbride as his type photograph number 17587.

Additional citations: PERU: Huámuco: Asplund 12580 (W—2224707). Department undetermined: Dombey s.n. [Peru] (W—1706491); Ruíz 187 [Macbride photos 17587] (W—photo). BOLIVIA: El Beni: H. H. Rusby 2619 (W—33109).

AEGIPHILA NOVOFRIBURGENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 7: 491. 1961.

An isotype of this species, P. Clausen 194, deposited in the herbarium of the Conservatoire et Jardin Botaniques at Geneva, was photographed there by Macbride as his type photograph number 28386.

Additional citations: BRAZIL: Rio de Janeiro: P. Clausen 194 [Macbride photos 28386] (W—photo of isotype).

AEGIPHILA OBDUCTA Vell.

Additional bibliography: Angely, Fl. Paran. 7: 11. 1957; Moldenke, Phytologia 8: 17. 1961; Reitz & Klein, Sellowia 16: 55 & 108. 1964; Rambo, Pesquis. Bot. 21: 8 & [59]. 1965.

Rambo (1965) cites Herb. Anchieta 3258, 31676, 50296, 50333, 50354, 54375 [Reitz 6124], and 55608 [Reitz 5170] from Santa Catarina, Brazil, all collected by himself except where otherwise designated. He describes the plant as a "Half-climber with spreading branches, up to 5 m high", growing in "Half-high forests, secondary growth.....just reaching the northeastern sea coast (31676)" of Rio Grande do Sul, with a general distribution "From Amazonia down to RGS [Rio Grande do Sul]".

Additional citations: BRAZIL: Paraná: Hatschbach 4986 (A). Santa Catarina: Gaudichaud 173 (P); Hatschbach 1927 (W—2027120); Reitz 3574 (W—2027879); Reitz & Klein 1864 (N).

AEGIPHILA OBOVATA Andr.

Additional bibliography: Robledo, Lecc. Bot. 2: 499. 1940; Moldenke, Phytologia 7: 492—493. 1961.

Cowan & Proctor describe this species as a tree, 4 m. tall, with pendent branches and pale-yellow flowers, growing in primary forests and on lower cultivated slopes, at 150—600 meters altitude, blooming in April.

Additional citations: TOBAGO: Cowan & Proctor 1455 (N).

AEGIPHILA ODONTOPHYLLA Donn. Sm.

Additional bibliography: Moldenke, Phytologia 7: 493 (1961) and 13: 319. 1966.

The H. F. Smith 110 and Stork 4210, distributed as this species in some herbaria, are actually the related A. aculeifera Moldenke.

AEGIPHILA PANAMENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 7: 493--494. 1961.

Brenes found this plant growing at 1100 meters altitude, flowering in June. The Feddema 1887, distributed in some herbaria as A. panamensis, is actually a species of Schlegelia.

Additional citations: COSTA RICA: Alajuela: Brenes s.n. [Herb. Inst. Physico-geogr. Nat. Costaric. 14484] (G).

AEGIPHILA PANICULATA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 494. 1961.

Duke refers to this plant as a vine or shrub, with greenish flowers, blooming in September.

Additional citations: PANAMA: Darien: Duke 4095 (Ca), 4109 (Z). Panamá: Duke 3805 (Ca).

AEGIPHILA PARAGUARIENSIS Briq.

Additional bibliography: Angely, Fl. Paran. 7: 11. 1957; Moldenke, Phytologia 8: 17. 1961.

A specimen of Hassler 4498, deposited in the herbarium of the Conservatoire et Jardin Botaniques at Geneva, was photographed there by Macbride as his type photograph number 24618.

Recent collectors have found this species growing in campo cerrado (widely scattered scrub) in Paraná, at 950 meters altitude, fruiting in January. Rojas found it flowering in October.

Additional citations: BRAZIL: Goiás: N. T. Silva 57727 (N). Paraná: Hatschbach 7687 (Ca), 8523 (Ca), 8524 (Ca); Smith, Klein, & Hatschbach 14729 (Ac). São Paulo: Lanna Sobrinho 136 [Herb. Cent. Pesq. Florest. 1222] (Ac); Mimura 160 (W--2445190). PARAGUAY: Hassler 4498 [Macbride photos 24618] (W--photo of cotype); T. Rojas s.n. [Hassler 10852] (A).

AEGIPHILA PARVIFLORA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 495 (1961) and 13: 328. 1966.

Recent collectors describe this plant as a tree, 10 m. tall, or a small shrub, with an irregular crown, the trunk to 40 cm. in diameter, and white flowers, growing in meadows, called "papagaio", and blooming in June. Material has been misidentified and distributed in herbaria under the names A. integrifolia (Jacq.) Jacks. and Aegyphylla sp.

A specimen of Spruce 589, an isotype of the species, deposited in the herbarium of the Conservatoire et Jardin Botaniques at Geneva, was photographed there by Macbride as his type photograph number 28387.

Additional citations: VENEZUELA: Apure: Borsotti 3 (Ve), 53 (Ve--39518); Ll. Williams 13401 (W--1802205). BRAZIL: Minas Gerais: Heringer 5802 (B). Pará: Spruce 589 [Macbride photos 28387] (W--photo of isotype).

AEGIPHILA PENDULA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 496. 1961; Moldenke, Résumé Suppl. 12: 3. 1965.

Additional citations: VENEZUELA: Amazonas: Ewel 199 (Z).

AEGIPHILA PERUVIANA Turcz.

Additional synonymy: Aegiphila peruana Turcz. ex Soukup, Biota 4: 81, sphalm. 1962.

Additional bibliography: Moldenke, Phytologia 7: 496—497. 1961; Soukup, Biota 4: 81. 1962.

An isotype, Spruce 4275, deposited in the herbarium of the Conservatoire et Jardin Botaniques in Geneva, was photographed there by Macbride as his type photograph number 24619. Soukup collected the species in anthesis in August. Woytkowski describes the plant as a shrub, 2.5 meters tall, with yellow fruit in March, growing in secondary forests at 500 meters altitude.

Additional citations: PERU: San Martín: Spruce 4275 [Macbride photos 24619] (W—photo of isotype); Woytkowski 5443 [wood voucher 15513] (W—2413510), 7136 (W—2453490). Department undetermined: Soukup 4371 [Villarica] (W—2199967).

AEGIPHILA PLATYPHYLLA Briq.

Additional synonymy: Aegiphilla platyphylla Briq. ex Moldenke, Résumé Suppl. 13: 6, in syn. 1966.

Additional bibliography: Moldenke, Phytologia 7: 497. 1961; Moldenke, Résumé Suppl. 13: 6. 1966.

The type specimen, Hassler 8056, deposited in the herbarium of the Conservatoire et Jardin Botaniques at Geneva, was photographed there by Macbride as his type photograph number 24620.

Additional citations: PARAGUAY: Hassler 8056 [Macbride photos 24620] (Mi—isotype, W—2055326—isotype, W—photo of type).

AEGIPHILA PURPURASCENS Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 27: 2026. 1953; Moldenke, Phytologia 7: 498. 1961.

AEGIPHILA QUINDUENSIS (H.B.K.) Moldenke

Additional bibliography: Moldenke, Phytologia 7: 498 (1961) and 13: 333. 1966.

Recent collectors call this a treelet, to 5 m. tall, not much branched, growing at 900 meters altitude, fruiting from September to November. Material has been misidentified and distributed in herbaria as A. membranacea Turcz.

Dr. Julian A. Steyermark, in a letter to me dated November 8, 1963, says: "I was not able to place my specimen (no. 91800) with certainty in A. quinduensis, as there was some question in my mind as to whether it might not be A. martinicensis. We have no material of the latter here for comparison. The difference given in your key on p. 275 under the 'calyx-rim distinctly toothed, lobed, etc.' category to separate A. martinicensis with 'blades firmly membranous,

etc.' from A. quinduensis with 'blades thin-chartaceous or submembranous' is not altogether easy to apply in this present case. Also, some of the calyx-rims in my specimen appear subtruncate or repand and could be placed in the section of your key on p. 269."

Additional citations: VENEZUELA: Aragua: Aristeguieta 5155 (Ve); J. García 53 (Ve—30983); Lasser 2058 (Ve—25129); H. Pittier 15474 (Ve—26967), 15481 (Ve—26896), 15648 (Ve—26999); Pittier & Nakichenovick 15550 (Ve—29312); J. A. Steyermark 91800 (B). Federal District: Lasser 2121 (Ve—25213); J. A. Steyermark 91507 (B, W—2430130). Miranda: Aristeguieta 4854 (Ve, Z). Monagas: J. A. Steyermark 62046 (Ve—25594).

AEGIPHILA RACEMOSA Vell.

Additional bibliography: Moldenke, Phytologia 7: 498—499. 1961.

Archer and Silva both describe this plant as a vine. Recent collectors have found it on terrafirma, blooming in January and March. The flowers are described as "yellow" on Archer 8278 and A. Silva 93, and "green" on Archer 8120.

Additional citations: VENEZUELA: Bolívar: Lasser 1983 (Ve); J. A. Steyermark 88441 (N). BRAZIL: Amazonas: G. P. Cooper s.n. [Lower Rio Madeira, March 20—24, 1945] (W—2439074), s.n. [Itapumua] (N). Pará: Archer 8120 (N), 8141 (W—2439075), 8278 (N); Murça Pires 8227 (N); A. Silva 93 (N, W—2439609). MOUNTED ILLUSTRATIONS: Moldenke, Phytologia 2: 441, fig. 4. 1948 (N).

AEGIPHILA RIEDELIANA Schau.

Additional bibliography: Moldenke, Phytologia 7: 499. 1961; Rambo, Pesquis. Bot. 21: 8 & [59]. 1965.

A cotype, J. E. Pohl 4392, deposited in the herbarium of the Naturhistorisches Museum in Vienna, was photographed there by Macbride as his type photograph number 34309.

Rambo (1965) cites Herb. Anchieta 58406 [Reitz 8383] from Santa Catarina and 40320 and 59493 [Camargo 881] from Rio Grande do Sul, the second being his own collection. He describes the plant as a "Small tree, up to 5 m high", growing in "Half-high wood, secondary growth", and found "So far, northeastern Highlands only" in Rio Grande do Sul, with a general distribution "From Bahia to RGS [Rio Grande do Sul]".

Additional citations: BRAZIL: Bahia: J. E. Pohl 4392 [Macbride photos 34309] (W—photo of cotype).

AEGIPHILA RORAIMENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 7: 500. 1961.

Steyermark reports this plant to be a tree, 5 m. tall, the leaves membranous, dull-green on both surfaces, and the pubescence on the stems, peduncles, and calyx fulvous tawny-brown, growing at 1600 m. altitude, and blooming in May.

Additional citations: VENEZUELA: Bolívar: Lasser 1838 (Ve); J.

A. Steyermark 60812 (Ve—35968), 93834 (Lw), 94085 (Z).

AEGIPHILA SALTICOLA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 500. 1961.

Additional citations: BRAZIL: São Luiz Island: Fróes 11856 (Mi, W—1830837).

AEGIPHILA SELLOWIANA Cham.

Additional bibliography: Angely, Fl. Paran. 7: 11. 1957; Reitz, Sellowia 11: 49, 66, & 84. 1959; Rambo, Pesquis. Bot. 12: 21. 1961; Moldenke, Phytologia 7: 501. 1961; Reitz & Klein, Sellowia 16: 44, 64, & 103. 1964; Rambo, Pesquis. Bot. 21: 8—9 & [59]. 1965.

Recent collectors have found this plant flowering in May and fruiting in May and August. The leaves on Belém 1459 are up to 36 cm. long and 16 cm. wide!

Reitz (1959) records the vernacular names "gaileira", "gaioleira", "pau-de-gaiola", "pau gaiola", "tamanqueira", and "tamanqueiro". Angeli records the name "molulo". Castellanos found the plant in flower in November.

The Sehnem 2149, distributed as A. sellowiana, is actually A. brachiata Vell., while Hatschbach 2644 and Machado de Campos 141 are A. verticillata Vell.

Rambo (1965) cites Herb. Anchieta 31530 and 58429 from Santa Catarina and 1216, 3762, 7843 [Theissen s.n.], 11822 [Emrich s.n.], 27529 [Henz s.n.], 32625 [Henz s.n.], 35671 [Henz s.n.], 38582, 38835, 38898, 38921, 39062, 40774, 48540 [Sehnem 3739], 46221, 51009 [Sehnem 5606], 52931, 57590 [Pivetta 647], 61784 [Camargo 2864], and 62348 [Camargo 1714], from Rio Grande do Sul, all collected by himself except where otherwise designated. He describes the plant as a "Small tree, up to 8 m high", growing at "Edge of the forest, secondary growth, Campos woodlots" in the "Northeastern Lowlands, and slope of the Highlands only" in Rio Grande do Sul, with a general distribution of "From Amazonia to RGS [Rio Grande do Sul]".

Additional citations: BRAZIL: Bahia: Belém & Magahlães 1091 (Ac). Espirito Santo: Belém 1459 (Ac). Guanabara: A. Castellanos 23484 [Herb. Cent. Pesq. Florest. 1714] (Pf); Lanna Sobrinho 115 [Herb. Cent. Pesq. Florest. 1159] (Ac). Paraná: Hatschbach 2615 (W—2057308), 7709 (Ca). Rio de Janeiro: Angeli 100 [Herb. Cent. Pesq. Florest. 333] (Ac), 101 [Herb. Cent. Pesq. Florest. 335] (Ac); O. M. Barth I.71 [Herb. Inst. O. Cruz 98] (W—2342877). Rio Grande do Sul: Rambo 52931 (B); Sehnem 3739 (B), 5606 (B, B). Santa Catarina: Klein 132 (W—2120120); Reitz 3379 (W—2027846); Reitz & Klein 7259 (N), 8257 (N), 17357 (Ac).

AEGIPHILA SESSILIFLORA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 502. 1961; Moldenke, Résumé Suppl. 12: 2 & 3. 1965; Moldenke, Phytologia 13: 328.

1966.

Recent collectors describe this plant as a tree, 6—10 m. tall, with an irregular crown and green fruit, growing at 1200 to 1400 m. altitude, and flowering in May and August. Archer refers to it as "rare in this locality" in Antioquia. Material has been misidentified and distributed in herbaria as A. integrifolia (Jacq.) Jacks. and as Lucuma sp.

Additional citations: COLOMBIA: Antioquia: Archer 589 (W—1517393). Cundinamarca: Fernández & Mora 1402 (W—2144385). VENEZUELA: Trujillo: Lasser 1167 (W—1908975).

AEGIPHILA SESSILIFLORA var. CUATRECASASI Moldenke

Additional bibliography: Moldenke, Phytologia 8: 385. 1962; Hocking, Excerpt. Bot. A.6: 455. 1963; Moldenke, Biol. Abstr. 42: 1517. 1963.

Citations: COLOMBIA: Magdalena: Cuatrecasas & Castañeda 25404 (Z—type).

AEGIPHILA SKUTCHII Moldenke

Additional bibliography: Moldenke, Phytologia 7: 502. 1961.

Breedlove describes this plant as 10 feet tall, with white flowers, growing on a steep moist slope at 6100 feet altitude, flowering in August.

Additional citations: MEXICO: Chiapas: Breedlove 11978 (Z); Matuda 4190 (Rf).

AEGIPHILA SMITHII Moldenke

Additional bibliography: Moldenke, Phytologia 7: 502—503. 1961.

Additional citations: PERU: Loreto: Asplund 14048 (W—2224811); Mexia 6499 (W—1691256). San Martín: Klug 3894 (W—1458301).

AEGIPHILA SPICATA (Rusby) Moldenke

Additional bibliography: K. Schum. in Just, Bot. Jahresber. 28 (1): 295. 1902; Moldenke, Phytologia 7: 503. 1961.

AEGIPHILA SPLENDENS Schau.

Additional bibliography: Moldenke, Phytologia 7: 503. 1961.

The type of this species, J. E. Pohl 1022, deposited in the herbarium of the Naturhistorisches Museum in Vienna, was photographed there by Macbride as his type photograph number 34308.

Additional citations: BRAZIL: Minas Gerais: J. E. Pohl 1022 [Macbride photos 34308] (W—photo of type).

AEGIPHILA SPRUCEANA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 503—504. 1961.

An isotype of this species, Spruce 2296, deposited in the herbarium of the Conservatoire et Jardin Botaniques at Geneva, was photographed there by Macbride as his type photograph number 28388.

Additional citations: BRAZIL: Amazonas: Spruce 2296 [Macbride photos 28388] (W—photo of isotype).

AEGIPHILA STEYERMARKII Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 35: 2177. 1960; Moldenke, Phytologia 7: 504. 1961; Hocking, Excerpt. Bot. A.4: 593. 1962.

Steyermark & Aristeguieta describe this plant as a shrub, 1.5 m. tall, the leaves subcoriaceous, deep dull-green above, dull-green beneath, the nervation raised, the calyx gray-green, the corolla creamy-white, the filaments whitish, and the anthers buff-creamy, growing on forested slopes at 150 meters altitude, flowering in March.

Additional citations: VENEZUELA: Bolívar: Steyermark & Aristeguieta 79 (Z).

AEGIPHILA STEYERMARKII var. MACROPHYLLA Moldenke

Additional bibliography: Moldenke, Phytologia 7: 504—505. 1961; Hocking, Excerpt. Bot. A.4: 593. 1962.

AEGIPHILA TRUNCATA Moldenke

Additional bibliography: Moldenke, Phytologia 8: 17. 1961; Moldenke, Biol. Abstr. 37: 215. 1962.

Additional citations: COLOMBIA: Antioquia: Metcalf & Cuatrecasas 30072 (W—1833329).

AEGIPHILA UMBRACULIFORMIS Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 30: 3551. 1956; Moldenke, Phytologia 8: 17. 1961.

AEGIPHILA VALERII Standl.

Additional bibliography: Moldenke, Phytologia 8: 17 (1961) and 13: 319. 1966.

Matuda describes this plant as a tree, 20 meters tall. The Cazalet & Pennington 5090, distributed as A. valerii, is actually A. alba Moldenke.

Additional citations: MEXICO: Chiapas: Matuda 4876 (Rf).

AEGIPHILA VENEZUELENSIS Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 33: 1215. 1959; Moldenke, Phytologia 8: 18. 1961; Hocking, Excerpt. Bot. A.5: 44. 1962.

Steyermark and his associates describe this plant as a shrub or straggling shrub, 2 feet tall, the leaves subcoriaceous or membranous, dull-green or rich-green above, dull or dull-green beneath, the flowers pendent, pale-green, growing along streams at altitudes of 1575—1700 meters, flowering in May.

Additional citations: VENEZUELA: Bolívar: J. A. Steyermark 60263 (W—1901830), 75516a (Ve); Steyermark, Dunsterville, & Dunsterville 92604 (Lw).

AEGIPHILA VENEZUELENSIS var. SERRATA Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 33: 1215. 1959; Moldenke, Phytologia 8: 18. 1961; Hocking, Excerpt. Bot. A.5: 44. 1962.

AEGIPHILA VERRUCOSA Schau.

Additional bibliography: Moldenke, Phytologia 8: 19. 1961.

Recent collectors describe this plant as a tree, 10 meters tall, the leaves subcoriaceous, deep-green above, dull-green beneath, the flower-buds and calyx gray-green, the corolla creamy, growing at 1700 to 1800 meters altitude, flowering in June and October. An isotype, Moritz 897, deposited in the herbarium of the Conservatoire et Jardin Botaniques at Geneva, was photographed there by Macbride as his type photograph number 28389.

Additional citations: VENEZUELA: Aragua: Aristeguieta & Medina 2964 (Ve--42095), 2972 (Ve--42104); Moritz 897 [Macbride photos 28389] (W--photo of isotype); Steyermark & Allen 90886 (N). Federal District: Lasser 978 (Ve--25955), 979 (Ve--26069). Mérida: B. Maguire 39437 (N).

AEGIPHILA VERTICILLIATA Vell.

Additional bibliography: Angely, Fl. Paran. 7: 11. 1957; Moldenke, Phytologia 8: 19--20. 1961.

Mimura collected this species in a savanna of cerado vegetation. The actual type specimen of A. tomentosa Cham., Sellow 5122, deposited in the herbarium of the Botanisches Museum at Berlin, was photographed there by Macbride as his type photograph number 17589, but is now destroyed. A specimen of Casaretto 2624, in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, was photographed by him as his type photograph number 24615 and may be regarded as the type of A. lanata Casar.

Recent collectors have found A. verticillata growing on rocky campos and sandstone ledges, at stream margins, and in bogs, forests, and fallow fields, at 950 meters altitude, flowering in January. Material has been misidentified and distributed in herbaria as A. sellowiana Cham.

Additional citations: BRAZIL: Minas Gerais: Casaretto 2624 [Macbride photos 24615] (W--photo). Paraná: Hatschbach 2644 (W--2057321); Hatschbach & Pereira 7668 [Herb. Hatschbach 10285] (Lw); Reitz & Klein 17562 (Ac), 17876 (Ac); Smith, Klein, & Hatschbach 14508 (Ac). São Paulo: Machado de Campos 141 (N, W--2369519); Mimura 23 (W--2404883), 49 (W--2404900); Sellow 5122 [Macbride photos 17589] (W--photo).

AEGIPHILA VILLOSA (Aubl.) Gmel.

Additional synonymy: Aegiphila villosa (Aubl.) Gmel. ex Moldenke, Résumé Suppl. 7: 7, in syn. 1963.

Additional bibliography: Moldenke, Phytologia 8: 20. 1961; Moldenke, Résumé Suppl. 7: 7. 1963.

Recent collectors have found this plant growing in full exposure to the sun on disturbed areas, flowering in July, and describe it as a small tree, with white flowers.

Additional citations: BRAZIL: Amapá: W. A. Egler 1478 [Herb. Mus. Par. Emil. Goeldi 24634] (N); Fróes & Black 27481 (W--2248464); Murça Pires, Rodrigues, & Irvine 50327 (N, N).

AEGIPHILA VITELLINIFLORA Klotzsch

Additional synonymy: Aegiphila vittelliniflora Klotzsch ex Rambo, Pesquis. Bot. 21: 58, sphalm. 1965.

Additional bibliography: Hayek in Engl., Bot. Jahrb. 42: 172. 1908; Moldenke, Phytologia 8: 20--21. 1961; Rambo, Pesquis. Bot. 21: 58. 1965; Moldenke, Résumé Suppl. 13: 6. 1966; Moldenke, Phytologia 13: 321. 1966.

Sampaio records the vernacular name "marmelinho" for this plant.

Additional citations: BRAZIL: Rio de Janeiro: Aguillar s.n. [2-12-1922] (Ja--111104, Ja); Sampaio 8199 (Ja--44835).

AEGIPHILA VITELLINIFLORA var. EGLERI Moldenke

Bibliography: Moldenke, Phytologia 8: 385. 1962; Moldenke, Biol. Abstr. 42: 1517. 1963; Hocking, Excerpt. Bot. A.6: 455. 1963.

Citations: BRAZIL: Amapá: Irwin, Egler, & Murça Pires 47162 (N--type).

AEGIPHILA WIGANDIOIDES Lundell

Additional bibliography: Moldenke, Phytologia 4: 438. 1953; Moldenke, Biol. Abstr. 37: 1062. 1962.

Additional citations: MEXICO: Chiapas: Matuda 4253 (Ld--isotype).

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ADDITIONAL NOTES ON THE GENUS LIPPIA. I

Harold N. Moldenke

LIPPIA Houst.

Additional & emended bibliography: Robins. & Fernald in A. Gray, New Man. Bot., ed. 7, 688--690 & 906, fig. 881 & 882. 1908; Loes., Verh. Bot. Ver. Brand. 53: 43 & 75--78 [Abhandl. 240--243]. 1912; J. Matsumura, Ind. Pl. Jap. 2 (2): 533. 1912; Dunn & Tutcher, Kew Bull. Misc. Inf. Addit. Ser. 10: 201. 1912; Uphof in Karst. & Schenck, Vegetationsbild. 21 (1-2): n.p. 1930; H. B. Davis, Life & Works Pringle 47, 52, 56, 58, 81, 97, 124, 136, 143, 144, 187, 204, 235, 301, 668, & 669. 1936; Moldenke, Biol. Abstr. 33: 1215 & 1862. 1959; Goodspeed, Pl. Hunt. Andes 162. 1961; Moldenke, Biol. Abstr. 36: 4036 (1961) and 37: 1062. 1962; Hocking, Excerpt. Bot. A.5: 44

& 45. 1962; Dyer, Verdoorn, Codd, & Letty, Wild Fls. Transv. 281, pl. 140, fig. 4. 1962; Rickett, New Field Book Am. Wild Fls. 280. 1963; Thieret, Castanea 28: 170. 1963; Loewenfeld, Herb Gardening 214 & 216—217. 1964; Angely, Bibl. Veg. Paran. 44 & 242. 1964; Gooding, Loveless, & Proctor, Fl. Barbados 353, 362, & 476. 1965; Neal, In Gard. Hawaii, ed. 2, 721 & 724. 1965; Anon., Biol. Abstr. 46 (19): B.72 (1965), 46 (21): B.53 & B.128 (1965), and 46 (22): B.73 & B.131. 1965; Rambo, Pesquis. Bot. 21: 24—29, 58, & [59]. 1965; Hocking, Excerpt. Bot. A.8: 226 (1965) and A.9: 367. 1965; Moldenke, Biol. Abstr. 46: 3246 & 3616 (1965) and 46 (23): B.72 & B.94. 1965; Moldenke, Résumé Suppl. 12: 1—7 & 9—12. 1965; Moldenke, Phytologia 12: 6—71, 73—120, 130—181, 187—242, 252—312, & 331—367 (1965), 12: 478—506, 508—510, & 512 (1966), and 13: 1—35. 1966; Moldenke, Résumé Suppl. 13: 1, 3, 4, & 7. 1966; A. Löve, Taxon 15: 161. 1966; Anon., Biol. Abstr. 47 (8): S.79. 1966.

In the main body of this work, to which this is the first supplement, 16,427 herbarium specimens and 854 mounted photographs and other illustrations are cited.

An anonymous editor of "Biological Abstracts" [46 (23): B.72 & B.94] places the genus Lippia in the family Phytolaccaceae for some reason entirely unknown to me!

Several additional abbreviations for the names of herbaria in which cited material is deposited used in the following notes will be explained in my Callicarpa paper which will appear shortly on these pages.

LIPPIA ABYSSINICA (Otto & Dietr.) Cuf.

Additional bibliography: Moldenke, Biol. Abstr. 37: 1062. 1962; Moldenke, Résumé Suppl. 12: 6 & 10. 1965; Moldenke, Phytologia 12: 23, 39—44, 175, 176, 230, 232, 298, 305, 307, 350—352, 431, 447, 458, & 459 (1965), 12: 483 (1966), and 13: 171. 1966; Moldenke, Résumé Suppl. 13: 7. 1966.

According to Troupin this plant may attain a height of 3 meters; his II.635 is described as having had white corollas, flowering in March. He records the vernacular name "umuzirarorwe". The A. Peter 41351, distributed as L. adoënsis Hochst., is actually L. schliebeni Moldenke.

Additional citations: ERITREA: Pappi 5602 (W—1969226). ETHIOPIA: Schimper 376 (W—806464). RUANDA: Troupin II.635 (W—2375118). ANGOLA: Province undetermined: A. Rocha 60 [Malange] (UI).

LIPPIA ABYSSINICA var. PUBESCENS (Moldenke) Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 37: 1062. 1962; Moldenke, Phytologia 12: 43—44. 1965; Moldenke, Résumé Suppl. 13: 7. 1966.

LIPPIA ACUTIDENS Mart. & Schau.

Additional bibliography: Moldenke, Phytologia 12: 24 & 44—45.

1965.

Additional citations: BRAZIL: Minas Gerais: Martius s.n. [Yha; Macbride photos 20319] (W--photo of type).

LIPPIA AFFINIS Schau.

Additional bibliography: Moldenke, Phytologia 12: 23, 26, 46--48, 61, 162, 164, 170, 189, 196, 219, 283, 332, 339, 346, & 455. 1965.

The Mello Barreto collection cited below was originally identified and distributed as L. origanoides H.B.K.

Additional citations: BRAZIL: Minas Gerais: Mello Barreto 10804 (Ja--45908).

LIPPIA ALBA (Mill.) N. E. Br.

Additional & emended synonymy: Lippia panamensis Turcz., Bull. Soc. Nat. Mosc. 36 (2): 201--202. 1863. Lippia havannensis Turcz., Bull. Soc. Nat. Mosc. 36 (2): 202--203. 1863. Lippia melissaeodora C. A. Mey. ex Moldenke, Résumé Suppl. 12: 10, in syn. 1965. Lippia melissacodora C. A. Mey. ex Moldenke, Résumé Suppl. 12: 10, in syn. 1965.

Additional bibliography: Loes., Verh. Bot. Ver. Brand. 53: 75 [Abhand. 240]. 1912; H. B. Davis, Life & Works Pringle 52. 1936; Moldenke, Biol. Abstr. 36: 4036. 1961; Angely, Bibl. Veg. Paran. 44. 1964; Moldenke, Résumé Suppl. 12: 2, 9, & 10. 1965; Rambo, Pesquis. Bot. 21: 24 & [59]. 1965; Buchheim, Huntia 2: 38. 1965; Moldenke, Phytologia 12: 24, 47--71, 76, 81, 96--98, 115, 119, 158, 179, 187, 189, 190, 196, 217, 219, 225, 228--232, 235, 236, 240, 260, 262, 264, 332, 340, 358, 434, 450, & 459 (1965), 12: 487 & 505 (1966), and 13: 17, 19, 21, 26, & 32. 1966.

The name, Lippia melissaeodora, appears to be based on the Herb. Hort. Bot. Petrop. s.n. deposited in the Leningrad herbarium, a duplicate of which is in the United States National Herbarium at Washington.

The Eitens record the species as escaped from cultivation in Maranhão, Brazil, where it is used to make a tea in the treatment of colds or simply for its flavor. They describe the flowers as lilac, the center darker lilac or golden-yellow with a white halo.

The Bailetti 238, Herb. Inst. Miguel Lillo 32060, 32063, & 32075, and Lillo 3842, distributed as this species, are actually all L. suffruticosa (Griseb.) Kuntze, Sanzin 1832 and Venturi 8120 & 8518 are L. turbinata Griseb., and Martinez & Trevino 29 & 43 are Lantana macropoda Torr.

Turczaninow (1863) describes his L. havannensis as follows: "L. caule tereti fruticoso multirameo, ramisque pube adpressa vestitis; foliis petiolatis oppositis parvis ellipticis obtusis, basi in petiolum attenuatis crenatis, longitudine petiolorum supra rugosis, utrinque subtus densius tomentosis; pedunculis in axillis solitariis folia aequantibus; capitulis hemisphaericis; bracteis lanceolatis acutiusculis glandulosis margine ciliatis, tubum corollae tegentibus; calycibus pubescentibus carina dense

ciliatis. Flores e schedula albi." He describes his L. panamensis as follows: "L. ramis teretiusculis aut superne subtetragonis, breviter ramulosis; foliis petiolatis oppositis ternatisve parvulis ovatis acutiusculis, basi in petiolum angustatis, parvo spatio integerrimis, dein crenatis, triplinerviis, supra bullato-rugosis glabriusculis, subtus pubescentibus; pedunculis in axillis solitariis petiolum duplo superantibus, foliis brevioribus; bracteis late rhombeis in acumen breve productis, calycibus que dorso anguste alatis, totis pilosis; tubo corollae calycem duplo excedente; coccis maturitate secedentibus. Habitus fere L. geminatae, at folia duplo minora, in pagina superiore rugosa glabra calycesque tenuiter sed manifeste alati." He places it in Section Dipterocalyx.

Rambo (1965) cites Schauer's work in Martius, Fl. Bras. as "1951" instead of 1851, doubtless through an orthographic or typographic error. He cites Herb. Anchieta 434, 10138, 11265 [Emrich s.n.], 11545 [Buck s.n.], 26430 [Buck s.n.], 27560 [Henz s.n.], 28261, 29629 [Emrich s.n.], 35551 [Henz s.n.], 38012, 39489, 43206, 47332 [Spies s.n.], 47815 [Sehnem 3823], 49694, 50497 [Sehnem 3872], 59158 [Pivetta 970], and 61654 [Camargo 2785] from Rio Grande do Sul, all collected by himself, many from cultivated material, except where otherwise designated. He describes the plant as a "Shrub with long, virgate, more or less recumbent branches", growing "apparently on sandy, dry, shrubby Campos..... often cultivated for medicinal purposes; apparently native near the sea coast" in Rio Grande do Sul, with a general distribution "From southern USA to central Argentina and Uruguay."

Additional citations: TEXAS: Hidalgo Co.: M. L. Walker 34 (Ld). MEXICO: San Luis Potosí: Crutchfield & Johnston 5135 (Mi). Tamaulipas: R. M. King 4035 (Mi). WINDWARD ISLANDS: Martinique: R. A. Howard 11718 (Mi). VENEZUELA: Apuré: Humboldt & Bonpland s.n. [Macbride photos 39485] (W--photo). ECUADOR: Guayas: Fagerlind & Wibom 138 (Mi). BRAZIL: Ceará: Drouet 2561 (W--1692594). PARAGUAY: Hassler 7397 (Mi); T. Rojas 228 (A). CULTIVATED: Brazil: Eiten & Eiten 4850 (W--2445201). Russia: Herb. Hort. Bot. Petrop. s.n. (W--73531).

LIPPIA ALBA var. CARTERAE Moldenke

Additional bibliography: Moldenke, Phytologia 12: 71. 1965; Moldenke, Biol. Abstr. 36: 4036. 1961.

LIPPIA ALNIFOLIA Schau.

Additional bibliography: Moldenke, Phytologia 12: 24, 71, & 73--74. 1965.

Additional citations: BRAZIL: Minas Gerais: Martius s.n. [Macbride photos 20321] (W--photo of cotype).

LIPPIA AMERICANA L.

Additional bibliography: Moldenke, Phytologia 12: 20, 23, 63, 74--82, 208, 291, & 363 (1965) and 12: 484. 1966; Moldenke, Résumé Suppl. 13: 7. 1966.

Additional citations: COLOMBIA: Magdalena: H. H. Smith 450 (Mi). Santander do Norte: Schlim 274 [Macbride photos 24657] (W--photo).

LIPPIA AMERICANA f. HYPTOIDES (Benth.) Moldenke

Additional synonymy: Lippia hyptodes Benth. ex Kuntze, Rev. Gen. Pl. 3 (2): 252, sphalm. 1898.

Additional bibliography: Moldenke, Phytologia 12: 63, 77, & 79--81. 1965; Moldenke, Résumé Suppl. 13: 7. 1966.

LIPPIA ANGUSTIFOLIA Cham.

Additional bibliography: Moldenke, Résumé Suppl. 12: 10. 1965; Rambo, Pesquis. Bot. 21: 25 & [59]. 1965; Moldenke, Phytologia 12: 24, 82--85, 102, 205, 259, 293, 294, 347, & 464 (1965) and 13: 14 & 15. 1966.

It should be noted here that L. angustifolia Chod. is a synonym of L. tristis Briq.

Rambo (1965) cites Herb. Anchieta 25780 from Rio Grande do Sul and 36858 [Hatschbach 661] from Paraná, the former collected by himself. He describes the plant as a "Slender, woody shrub, unbranched, up to 1 m high", growing in "Swampy thickets" on the "Southwestern plains only" in Rio Grande do Sul, with a general distribution of "Minas Gerais to RGS [Rio Grande do Sul]; Paraguay to Uruguay."

Additional citations: BRAZIL: Minas Gerais: Sellow s.n. [Brasilia merid.; Macbride photos 17495] (W--photo of cotype). PARAGUAY: Hassler 7971 (A).

LIPPIA ARECHAVALETAE Moldenke

Additional bibliography: Rambo, Pesquis. Bot. 21: 25 & [59]. 1965; Moldenke, Phytologia 12: 86--87 & 366 (1965) and 13: 3. 1966.

Rambo (1965) cites Herb. Anchieta 2751, 3920, & 28181 from Rio Grande do Sul -- the first as "var. microphylla Mold." -- all collected by himself. He describes the plant as a "Slender, woody shrub, very elegant, up to 1 m high", growing on "Very dry Campos" in the "Western Campos area, rare" in Rio Grande do Sul, with a general distribution "From Paraná through Argentine Mesopotamia to western RGS [Rio Grande do Sul] and Uruguay."

LIPPIA ARECHAVALETAE var. MICROPHYLLA Moldenke

Additional bibliography: Rambo, Pesquis. Bot. 21: 25. 1965; Moldenke, Phytologia 12: 87. 1965.

LIPPIA ASPERRIMA Cham.

Additional bibliography: Rambo, Pesquis. Bot. 21: 25--26 & [59]. 1965; Moldenke, Phytologia 12: 24, 63, 88--94, 135, 136, 232, 290, 347, 429, & 434 (1965) and 13: 11, 12, 28, & 29. 1966.

The Jönsson 35a cited by me in Phytologia 12: 90 (1965) is actu-

ally L. turnerifolia Cham.

Rambo (1965) cites Herb. Anchieta 3035, 3040, 4159, 9350, 26114, 34486 [Augusto s.n.], 48041, 48281 [Hatschbach 1006], 53011, 53437, 59123 [Pivetta 981], 60323, 63153 [Spies s.n.], & 63196 [Spies s.n.] from Rio Grande do Sul, all collected by himself except where otherwise noted. He describes the plant as a "Small, woody shrub 10--50 cm high", growing on "Very dry, open, grassy Campos" in the "Western Campos area only" in that state, with a general distribution from "Minas Gerais to RGS [Rio Grande do Sul]; Paraguay to northern and northeastern Argentina".

Additional citations: BRAZIL: Paraná: Dombrowski 688 (Ac); Dombrowski, Saito, & Pereira 757/550/144 (Ac), 889/679/272 (Ac). ARGENTINA: Salta: T. Meyer 3452 [Herb. Inst. Miguel Lillo 35569] (G).

LIPPIA ASPERRIMA var. LONGIPEDUNCULATA Moldenke

Additional bibliography: Moldenke, Phytologia 12: 91--93 & 294 (1965) and 13: 29. 1966.

LIPPIA BALANSAE Briq.

Additional bibliography: Moldenke, Phytologia 12: 24, 63, 94--97, & 446. 1965.

Additional citations: PARAGUAY: Balansa 1033 [Macbride photos 24645] (W--photo of type), 1033a (N); Hassler 8653 (A).

LIPPIA BAUMII Gürke

Additional bibliography: Moldenke, Phytologia 12: 48, 56, 97--98, 225, & 230. 1965.

LIPPIA BELLATULA Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A.9: 367. 1965; Moldenke, Phytologia 12: 24 & 98--99. 1965; Moldenke, Biol. Abstr. 46: 3246. 1965.

Additional citations: BRAZIL: Bahia: Martius 1983 [Macbride photos 20322] (W--photo of type).

LIPPIA BOLIVIANA Rusby

Additional bibliography: Moldenke, Phytologia 12: 99--101 & 219. 1965.

Additional citations: BOLIVIA: Cochabamba: Eyerdam 24885 (G).

LIPPIA BOTHRIOURA Briq.

Additional bibliography: Moldenke, Phytologia 12: 84 & 101--103. 1965.

Additional citations: PARAGUAY: Hassler 7471 [Macbride photos 24646] (Mi--isotype, W--photo of type).

LIPPIA BRACTEATA Carr.

Additional bibliography: Moldenke, Phytologia 12: 103, 137, 160, & 265. 1965.

LIPPIA BRACTEOSA (Mart. & Gal.) Moldenke

Additional bibliography: Greenm., Field Mus. Publ. Bot. 2: 341. 1912; H. B. Davis, Life & Works Pringle 144. 1936; Moldenke, Phytologia 12: 102--105, 111, 115, & 268 (1965) and 12: 502. 1966; Moldenke, Résumé Suppl. 13: 1. 1966.

The flowers of this species are described as "yellow" on Breedlove 14194 and on Breedlove & Raven 13178. These collectors report that the plant is 3--4 feet tall, flowering in October and December, and growing on steep slopes with Quercus, at 2500--5100 feet altitude. The Rzedowski 17649, distributed as L. bracteosa, is actually L. inopinata Moldenke.

Additional citations: MEXICO: Chiapas: Breedlove 14194 (Z); Breedlove & Raven 13178 (Ac). Michoacán: Diguet s.n. [Barranca de Yungapeo, Octobre 1907] (Mi).

LIPPIA BURTONII J. G. Baker

Additional bibliography: Moldenke, Phytologia 12: 42, 105--106, 231, 232, 307, 352, & 431. 1965.

LIPPIA CAFFRA Sond.

Additional bibliography: Moldenke, Phytologia 12: 107 & 232. 1965.

LIPPIA CALLICARPAEFOLIA H.B.K.

Additional bibliography: Loes., Verh. Bot. Ver. Brand. 53: 78 [Abhandl. 243]. 1912; H. B. Davis, Life & Works Pringle 143 & 301. 1936; Moldenke, Résumé Suppl. 12: 2 & 10. 1965; Moldenke, Phytologia 12: 24, 98, 99, 104, 108--112, 132, 137, 207, 215, 268, 292, 360, 362, & 363 (1965), 12: 504 (1966), and 13: 7, 34, 35, & 162. 1966.

Gilly & Simpson describe this plant as a shrubby climber and found it growing on the bottom of a barranca, fruiting in February. The species has also been collected in fruit in January, and herbarium material has been misidentified and distributed in herbaria as Lagascea sp. The Mercado s.n. [Mayo 1945], distributed as L. callicarpaefolia, is actually L. pringlei Briq.

The following specimens are filed under L. callicarpaefolia in the Harvard University herbaria, but have not been verified by me: MEXICO: México: Seler & Seler 4446 (G). Morelos: Seler & Seler 376 (G). Vera Cruz: Ervendberg 278 (G); Kerber s.n. [Prope Cordoba, IX.821] (A). The Herb. Colo. A. & M. A. Coll. s.n., Hernandez Xolocotzi C.1444, and H. Pittier 1855, distributed as L. callicarpaefolia, are actually L. substrigosa Turcz., while Hinton 11910 is L. umbellata Cav.

Additional citations: MEXICO: México: Gilly & Simpson 23 (Mi); Paray 548 (Ip), 3340 (Ip). GUATEMALA: Amatitlan: Kellerman 6379 (W--2443056). Sacatepéquez: S. S. White 5271 (Ip).

LIPPIA CANDICANS Hayek
Additional bibliography: Moldenke, Phytologia 12: 113—114. 1965; Moldenke, Résumé Suppl. 12: 4. 1965.
This species has been found growing in chapada of tall trees on top of a low plateau at an altitude of 300 meters.
Additional citations: BRAZIL: Goiás: E. Y. Dawson 14695 (Z—photo); G. Gardner 3942 [Macbride photos 34329] (W—photo of type). Maranhão: Eiten & Eiten 4162a (W—2445195).

LIPPIA CARDIOSTEGIA Benth.
Additional bibliography: Moldenke, Phytologia 12: 63, 104, 114-116, 137, 189, 301, & 302 (1965) and 13: 34 & 162. 1966.
Breedlove 12098 is said to have had "yellow" flowers. This collector encountered the species on shrubby and on gradual heavily wooded slopes.
In the Harvard University herbaria there are also the following specimens filed under this species but not as yet verified by me: HONDURAS: Santa Bárbara: Molina R. 3661 (G). NICARAGUA: Ometepe Island: C. L. Smith s.n. [1893] (G). Department undetermined: C. Wright s.n. [1853—56] (G). COSTA RICA: Alajuela: Hunnewell 16720 (G). Heredia: P. H. Allen 565 (A).
Additional citations: MEXICO: Chiapas: Breedlove 12098 (Rf), 13921 (Ac).

LIPPIA CARVIODORA Meikle
Additional bibliography: Moldenke, Phytologia 12: 116—118 & 144. 1965.

LIPPIA CHACENSIS Moldenke
Additional bibliography: Moldenke, Phytologia 12: 63 & 119. 1965.

LIPPIA CHEVALIERII Moldenke
Additional bibliography: Moldenke, Phytologia 12: 42, 43, 119—120, & 130—131. 1965.

LIPPIA CHIAPASENSIS Loes.
Additional synonymy: Lippia chiapensis Loes. ex P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1246, sphalm. 1924.
Additional & emended bibliography: Loes., Verh. Bot. Ver. Brand. 53: 78—79 [Abhandl. 243—244]. 1912; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1246. 1924; Moldenke, Phytologia 12: 131—132 (1965), 12: 504 (1966), and 13: 35. 1966.
Breedlove & Raven found this plant growing on heavily wooded slopes and on slopes with Quercus and Pinus, at 4800—8200 feet altitude, and describe it as a shrub, 8 feet tall, flowering in November. Standley reduces the species to synonymy under L. umbellata Cav., but to this I cannot agree. The flowers are described as "yellow" on Breedlove 14073 & 14095.
In the Harvard University herbaria there are the following two

specimens identified as L. chiapasensis, but not verified as yet by me: MEXICO: Chiapas: Ghiesbreght 13 (G); E. W. Nelson 3482 (G). The former bears an annotation "aff. L. graveolens". The Ghiesbreght 634, distributed as L. chiapasensis, is actually L. substrigosa Turcz.

Additional citations: MEXICO: Chiapas: Breedlove 14073 (Rf), 14095 (Ac); Breedlove & Raven 8331 (Ac); Raven & Breedlove 20076 (Ac).

LIPPIA CHRYSANTHA Greenm.

Additional bibliography: Loes., Verh. Bot. Ver. Brand. 53: 78 [Abhandl. 243]. 1912; H. B. Davis, Life & Works Pringle 204. 1936; Moldenke, Phytologia 12: 132—133. 1965.

In the Harvard University herbaria there is a specimen of Seler & Seler 2023 (G) from Oaxaca, identified as this species, but not as yet verified by me. The Paray 3014, distributed as L. chrysantha, is actually L. pringlei Briq.

LIPPIA CIPOËNSIS Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 33: 1862. 1959; Moldenke, Phytologia 12: 133. 1965.

LIPPIA CONTERMINA Briq.

Additional bibliography: Moldenke, Phytologia 12: 134—136 & 290 (1965) and 13: 29. 1966.

LIPPIA CONTROVERSA Moldenke

Additional bibliography: Moldenke, Phytologia 12: 136—138 (1965), 12: 504 (1966), and 13: 162. 1966.

Breedlove & Raven encountered this species in dense woodland with Quercus and Pinus, at 5300 feet altitude, flowering and fruiting in January; their no. 8381 is described as having had "yellow" flowers. Rzedowski found the plant in oak and pine woods at 1600 meters altitude.

Additional citations: MEXICO: Chiapas: Breedlove & Raven 8381 (Z); J. Rzedowski 663 (Ip). HONDURAS: Morazán: N. L. H. Krauss 984 (Ac). Tegucigalpa: N. L. H. Krauss 991 (Ac).

LIPPIA CORIACEA Briq.

Additional bibliography: Moldenke, Phytologia 12: 138—140 (1965) and 13: 14. 1966.

LIPPIA CORYMBOSA Cham.

Additional bibliography: Moldenke, Phytologia 12: 140—141 & 366. 1965.

LIPPIA COSTARICENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 12: 141—142 & 302 (1965) and 13: 162. 1966.

LIPPIA CURTISIANA Moldenke
Additional bibliography: Moldenke, Phytologia 12: 142—143 (1965) and 13: 162. 1966.

LIPPIA DIAMANTINENSIS Glaz.
Additional bibliography: Moldenke, Phytologia 12: 144—146, 166, & 200. 1965.

LIPPIA DRACOCEPHALOIDES Turcz.
Additional bibliography: Moldenke, Phytologia 12: 146—147. 1965.
Turczaninow (1863) places this species in Section Rhodolippia.
Additional citations: BRAZIL: Brasilia: Heringer 8939/1133 (N).

LIPPIA DUARTEI Moldenke
Additional bibliography: Hocking, Excerpt. Bot. A.9: 367. 1965; Moldenke, Phytologia 12: 147—148. 1965; Moldenke, Biol. Abstr. 46: 3246. 1965.

LIPPIA DUMETORUM Herzog
Additional bibliography: Moldenke, Phytologia 12: 148, 170, & 203. 1965.

LIPPIA DURANGENSIS Moldenke
Additional bibliography: Moldenke, Phytologia 12: 149—150 (1965) and 13: 35 & 162. 1966.
Paray found this species flowering and fruiting in November. Material has been misidentified and distributed in herbaria as L. umbellata Cav.
Additional citations: MEXICO: Durango: Paray 3123 (Ip).

LIPPIA EKMANI Moldenke
Additional bibliography: Moldenke, Phytologia 12: 150—151. 1965; Rambo, Pesquis. Bot. 21: 26 & [59]. 1965.
Rambo (1965) cites Herb. Anchieta 3041 & 61369 [Pivetta 1157] from Rio Grande do Sul, the former collected by himself. He describes the plant as an "Elegant, woody shrub, up to 75 cm high", growing on "Dry, more or less shrubby Campos" in the "Western Campos only" in that state, with a general distribution of "Misiones; western RGS [Rio Grande do Sul]".

LIPPIA ELEGANS Cham.
Additional bibliography: Moldenke, Phytologia 12: 151—152, 170, 333, & 446 (1965) and 12: 488. 1966.
The flowers on Jesus 85 are described as "white". The F. C. Hoehne s.n. [Sta. Barbara, 10-1-1921], cited by me as this species in Phytologia 12: 152 (1965), proves to be L. rubiginosa Schau. instead. The Guedes 447 distributed as L. elegans is actually L. schomburgkiana Schau.
Additional citations: BRAZIL: Minas Gerais: Jesus 85 (Z).

LIPPIA ELLIPTICA Schau.

Additional bibliography: Moldenke, Phytologia 12: 153 & 437. 1965.

LIPPIA FELIPPEI Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A.9: 367. 1965; Moldenke, Phytologia 12: 154--155. 1965; Moldenke, Biol. Abstr. 46: 3246. 1965.

LIPPIA FERRUGINEA H.B.K.

Additional bibliography: Moldenke, Phytologia 12: 155--157 (1965) and 13: 1. 1966.

LIPPIA FLORIDA Cham.

Additional bibliography: Moldenke, Phytologia 12: 159--161 & 268. 1965.

The Tryons describe this plant as a few-stemmed shrub, to 2 m. tall, with lavender bracts and flowers that are yellowish to white, growing in grassland and sedgeland with shrubby areas, with sandstone and quartzite rocks and derived soils, at 1120 m. altitude, flowering in November.

Additional citations: BRAZIL: Minas Gerais: Tryon & Tryon 6835 (Ac).

LIPPIA FORMOSA T. S. Brandeg.

Additional bibliography: Moldenke, Phytologia 12: 161--162, 164, 189, 283, 332, & 339. 1965.

Recent collectors have found this plant fruiting in January.

Additional citations: MEXICO: Baja California: Guzmán Huerta H. 77 (Ip).

LIPPIA FRAGRANS Turcz.

Additional bibliography: Moldenke, Phytologia 12: 162--164, 189, 283, 332, & 339. 1965.

Recent collectors have found this plant growing at 1250 meters altitude, flowering in September.

Additional citations: CHILE: Coquimbo: Ricardi & Marticorena 4521/906 (Z).

LIPPIA FRANCENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 12: 164--165 & 268. 1965.

LIPPIA GARDNERIANA Schau.

Additional bibliography: Turcz., Bull. Soc. Nat. Mosc. 36 (2): 205. 1863; Moldenke, Phytologia 12: 145, 165--166, & 200. 1965.

Turczaninow (1863), in speaking of his L. cordata [=L. lacunosa Mart. & Schau.] says: "L. Gardneriana, e descriptione hujus, valde similis, at folia petiolo etiamsi brevissimo, tamen manifesto insident, obtusa nec acuta, bracteae praeter inferiores obtusae."

LIPPIA GEHRTII Moldenke
Additional bibliography: Moldenke, Phytologia 12: 166--167 & 268. 1965.

LIPPIA GENTRYI Standl.
Additional bibliography: Moldenke, Phytologia 12: 167--169 & 363 (1965) and 13: 162. 1966.

LIPPIA GLANDULOSA Schau.
Additional bibliography: Moldenke, Phytologia 12: 169--171, 222, & 440 (1965) and 12: 487. 1966.
The flowers on Belém 1156 are described as "cream-colored" and the plant was in anthesis in June.
Additional citations: BRAZIL: Bahia: Belém 1156 (Ac).

LIPPIA GRACILIS Schau.
Additional bibliography: Moldenke, Phytologia 12: 170, 172--173, & 454 (1965), 12: 488 (1966), and 13: 32 & 34. 1966.
The Löfgren 586, distributed as L. gracilis, is actually L. schomburgkiana Schau.

LIPPIA GRANDIFLORA Mart. & Schau.
Additional bibliography: Moldenke, Phytologia 12: 174--175 & 280. 1965.

LIPPIA GRANDIFOLIA Hochst.
Additional bibliography: Moldenke, Phytologia 12: 175--178 & 430 (1965) and 13: 174. 1966.
Troupin found this species growing in wooded savannas; his II. 670 is said to have had white flowers. The Troupin II.635, distributed as L. grandifolia, is actually L. abyssinica (Otto & Distr.) Cuf.
Additional citations: RUANDA: Troupin II.670 (W--2375141).

LIPPIA GRATA Schau.
Additional bibliography: Moldenke, Phytologia 12: 170, 178--179, & 455. 1965.

LIPPIA GRAVEOLENS H.B.K.
Additional synonymy: Lantana graveolens Crutchfield & Johnston, in herb.
Additional bibliography: Loes., Verh. Bot. Ver. Brand. 53: 76 & 77 [Abhandl. 241 & 242]. 1912; H. B. Davis, Life & Works Pringle 48 & 144. 1936; Moldenke, Phytologia 12: 162, 164, 170, 179--181, 187--194, 215, 283, 301, 310, 332, 333, 339, 340, & 363 (1965), 12: 504 (1966), and 13: 34. 1966; Moldenke, Résumé Suppl. 12: 1 (1965) and 13: 1. 1966.
Recent collectors describe this species as shrub, bush, or straggly brittle twiggy perennial 3--12 dm. tall, or a shrub 3--6 feet tall, aromatic, with light-yellow calyxes, cream, cream-white, or white to lemon-yellow corollas, and yellow anthers, growing on rocky clay

banks or rocky clay roadsides, hills, brushy slopes, or cliffs, among boulders, and on slopes or steep slopes with Quercus, at altitudes of 1000—1850 meters, flowering in June, July, September, and December. Breedlove 11777 & 13177 and Gentry, Barclay, & Arguelles 20221 are said to have had "white" flowers, while on Herald & Clark 429 they are described as "cream", on D. S. Correll 31565 "cream-white", on Correll & Wasshausen 27707 "lemon-yellow", and on Feddema 2288 & 2433 "white with a yellow throat". Rzedowski found the species growing in association with Heliotta parvifolia.

In the Harvard University herbaria there are specimens of Wiggins 11379 (G) from Baja California and of Nelson & Goldman 7220 (G), identified as L. palmeri S. Wats., which seem to be L. graveolens instead, although other material of the former collection is cited by me as L. palmeri. The Ghiesbreght 634, distributed as L. graveolens, is actually L. substrigosa Turcz.

Additional citations: TEXAS: Brewster Co.: D. S. Correll 31565 (Ld); E. Marsh 148 (Au—214069). Webb Co.: Correll & Correll 32139 (Ld). Zapata Co.: Correll & Wasshausen 27707 (Ld). MEXICO: Chiapas: Breedlove 11777 (Rf), 13177 (Ac). Coahuila: J. A. de la Cruz s.n. [17.V.1961] (Ip); Marín s.n. [17-I-1961] (Ip, Mi); E. Marsh 542 (Au—212494); E. G. Marsh 1832 (Au—213612); Salgado s. n. [26.V.1961] (Ip). Guerrero: Herald & Clark 429 (Mi); Lord & McComas 621 (Mi). Jalisco: Feddema 2288 (Mi), 2433 (Mi); J. Rzedowski 17557 (Mi). Morelos: Paray 3015 (Ip). Puebla: Gentry, Barclay, & Arguelles 20221 (W—2451102); J. Rzedowski 9010 (Ip). Querétaro: Paray 2148 (Ip). San Luis Potosí: J. Rzedowski 4533 (Ip, Ip), 6686 (Ip), 9425 (Ip). Tamaulipas: Crutchfield & Johnston 4986 (Mi); Gonzales Medrano 108 (Ip).

LIPPIA GRISEBACHIANA Moldenke

Additional bibliography: Moldenke, Phytologia 12: 194—197, 230, 236, & 240. 1965.

LIPPIA HASSLERIANA Chod.

Additional bibliography: Rambo, Pesquis. Bot. 21: 26 & [59]. 1965; Moldenke, Phytologia 12: 197—199 & 211 (1965) and 12: 490 & 491. 1966.

Rambo (1965) cites Herb. Anchieta 10004 from Rio Grande do Sul, collected by himself. He describes the species as a "Small shrub, up to 1 m high", growing on "Dry, shrubby Campos" and notes that in Rio Grande do Sul "One only findplace". He gives the general distribution of the species as "Paraguay, RGS [Rio Grande do Sul]".

The Hassler 8988c, distributed as L. hassleriana, is actually L. sclerophylla Briq.

LIPPIA HEDERAEFOLIA Mart. & Schau.

Additional bibliography: Mansf., Notizbl. Bot. Gart. Berlin 9: 155. 1924; Moldenke, Phytologia 12: 199—201, 274, & 437 (1965) and 12: 501. 1966.

LIPPIA HICKENII Troncoso

Additional bibliography: Moldenke, Phytologia 12: 202—203 (1965) and 12: 496. 1966.

LIPPIA HIERACIFOLIA Cham.

Additional bibliography: Rambo, Pesquis. Bot. 21: 26—27 & [59]. 1965; Moldenke, Phytologia 12: 203—205. 1965.

Rambo (1965) cites Herb. Anchieta 438, 1219, 1802, 4867, 6735, 8297 [Emrich s.n.], 8362 [Emrich s.n.], 9145, 9456, 9953, 10059, 10077, 25547 [Heidler s.n.], 25614, 25782, 27010, 28682 [Emrich s.n.], 29394, 35824 [Emrich s.n.], 38138, 38681, 39170, 39467, 39541, 39651, 40508, 40945, 46715, 46849, 51343, 53033, 58638 [Camargo 82], 58786 [Camargo 234], 50507 [Sacco s.n.], & 63931 [Sacco 558] from Rio Grande do Sul, all collected by himself except where otherwise designated. He describes the plant as "Herbaceous, from a woody rootstock, up to 1 m high", growing on "Dry, grassy or more or less shrubby Campos.....Frequent all over the Campos area" in that state, with a general distribution of "Argentine Mesopotamia, RGS [Rio Grande do Sul], Uruguay".

LIPPIA HIRSUTA L. f.

Additional bibliography: Moldenke, Biol. Abstr. 46: 3616. 1965; Moldenke, Résumé Suppl. 12: 10. 1965; Moldenke, Phytologia 12: 198, 205—209, 292, & 363 (1965), 12: 485 & 486 (1966), and 13: 165. 1966.

Additional citations: VENEZUELA: Mérida: Bernardi 3135 (N).

LIPPIA HIRTA (Cham.) Meisn.

Additional bibliography: Moldenke, Phytologia 12: 198, 199, & 209—211 (1965) and 12: 489 & 490. 1966.

This plant has been found growing at 900 meters altitude. The flowers on Reitz & Klein 17411 are described as "roxa".

Additional citations: BRAZIL: Paraná: Dombrowski 1477 [Herb. Inst. Def. Pat. Nat. 9449] (Ac); Reitz & Klein 17411 (Ac); Smith & Klein 11922 (Ac).

LIPPIA HYPOLEIA Briq.

Additional bibliography: Moldenke, Phytologua 12: 190, 213—216, & 302 (1965) and 13: 34 & 162. 1966; Moldenke, Résumé Suppl. 13: 1. 1966.

Raven & Breedlove describe this species as a shrub, 5—15 feet tall, growing on steep heavily wooded slopes with Quercus, Pinus, Liquidambar, and tree legumes, at altitudes of 2500—5500 feet. They describe the flowers as "white" on their nos. 19816 & 19948. The flowers are also said to have been white on Breedlove 13968 and Molina R. 11277 & 11330, "cream color" on Breedlove & Raven 13603,

and "pale-yellow" on Breedlove & Gregory 14215 and Dressler & Jones 190. Breedlove & Gregory found the plant growing on steep northwest facing slopes with Quercus and Arbutus. Rzedowski found it in much disturbed woods of Quercus, Liquidambar, and Clethra; Molina R. calls it "frequent in mixed wet woods" in Honduras. It has been collected in anthesis and fruit in October.

Additional citations: MEXICO: Chiapas: Breedlove 13968 (Rf); Breedlove & Raven 13603 (Ac), 13615a (Ac); Raven & Breedlove 19816 (Ac), 19948 (Ac). Nayarit: Breedlove & Gregory 14215 (Rf). Puebla: Paray 2801 (Ip). Vera Cruz: Dressler & Jones 190 (Mi); Paray 2892 (Ip); J. Rzedowski 18956 (Mi). HONDURAS: El Paraíso: Molina R. 11330 (W--2445228). Morazán: Molina R. 11277 (W--2445592).

LIPPIA INOPINATA Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A.8: 226. 1965; Moldenke, Phytologia 12: 217--218. 1965; Moldenke, Résumé Suppl. 12: 2 (1965) and 13: 1. 1966.

Rzedowski describes this species as a rare shrub, 2.5 m. tall, growing at 1700 m. altitude in "ladera ígnea con vegetación de bosque tropical deciduo" in Jalisco. Detling found it in xeric matorral on a gentle south slope with Opuntia, Bursera fagaroides, and Ipomoea intrapilosa at an altitude of 2045 meters, fruiting in October. McVaugh reports that it is "abundant" and describes it as a tree, 5--6 m. tall, with conspicuous greenish-white bracts, growing on steep hills in the deciduous forest with Bursera, Cordia, and various legumes, at 700 meters altitude, flowering in March, and also in deciduous forest in wooded ravines, the forest composed mostly of Acacia, Bursera, and Ipomoea. It has also been found in flower and fruit in November. Material has been misidentified and distributed in herbaria as L. bracteosa (Mart. & Gal.) Moldenke.

Additional citations: MEXICO: Aguascalientes: Detling 8739 (Mi). Jalisco: R. McVaugh 22888 (Mi); J. Rzedowski 17649 (Au--238081, Ip, Mi). Puebla: R. McVaugh 22493 (Mi).

LIPPIA INTEGRIFOLIA (Griseb.) Hieron.

Additional bibliography: Moldenke, Phytologia 12: 196 & 218--220. 1965.

Additional citations: ARGENTINA: Catamarca: Cristóbal 482 (Ca--1181622).

LIPPIA INTERMEDIA Cham.

Additional bibliography: Moldenke, Phytologia 12: 220--221 & 429. 1965.

LIPPIA IODOPHYLLA Schau.

Additional bibliography: Moldenke, Phytologia 12: 221--222 & 280. 1965.

Additional citations: BRAZIL: Rio de Janeiro: Castellanos 23221

[Herb. Cent. Pesq. Florest. 1068] (Z).

LIPPIA JALISCANA Moldenke
Additional bibliography: Moldenke, Phytologia 12: 222—223 (1965) and 13: 162. 1966.

LIPPIA JANGADENSIS S. Moore
Additional bibliography: Moldenke, Résumé Suppl. 12: 4. 1965; Moldenke, Phytologia 12: 223—225 (1965) and 13: 166. 1966.

LIPPIA JANGADENSIS var. EITENORUM Moldenke
Additional bibliography: Moldenke, Phytologia 12: 224—225. 1965; Moldenke, Résumé Suppl. 12: 4. 1965.

LIPPIA JAVANICA (Burm. f.) Spreng.
Additional bibliography: Wild, Kirkia 5: 4. 1965; Moldenke, Résumé Suppl. 12: 10. 1965; Moldenke, Phytologia 12: 225—235, 240, 264, 307, 343, 344, 352, 358, 431, 434, 436, 450, 459, & 461 (1965), 12: 483 (1966), and 13: 171, 173, 174, & 176. 1966; Moldenke, Résumé Suppl. 13: 4. 1966.

Recent collectors describe this plant as an "annual herb of the savannas" (Torre 7696 & 7706) or a shrub, 1—3 meters tall, the aromatic leaves used for making tea, growing in ruderal places, secondary woods, the edges of streams, and open forests of Parinari sp., at 500—800 meters altitude, flowering in April, May, November, and December, fruiting in November. The flowers are said to have been "white" on F. A. Mendonca 1201 & 1645 and Torre 1973 & 2367, "whitish" on Torre 2768, and "cream-white" on E. Sousa 157. The vernacular names "limuffgamuffga" and "m'fungofana" are recorded from Portuguese East Africa. Mendonca 737 is said to match Stuhlmann I.168, Sousa 158 matches Jackson 22, and Mendonca 1645 matches Schlechter 12230 and Wilms 1182 in the British Museum herbarium.

The A. Peter 2056 & 4263, distributed as this species, are actually L. schliebeni Moldenke, Garcia 315 and Torre 3637 are L. whytei Moldenke, while Baum 250 and Leendertz s.n. [20.X.1909] are L. wilmsii H. H. W. Pearson.

Additional citations: SOUTHERN RHODESIA: E. A. Robinson 6170 (N). PORTUGUESE EAST AFRICA: Cabo Delgado: Torre & Paiva 12020 (Ul). Inhambane: Torre 2768 (Ul). Limpopo: Torre 2367 (Ul). Lourenço Marques: F. A. Mendonça 1645 (Ul), 3013 (Ul); E. Sousa 157 (Ul), 158 (Ul); Torre 1973 (Ul), 7696 (Ul), 7706 (Ul). Manica e Sofala: Andrada 1147 (Ul), 1244 (Ul). Mozambique: F. A. Mendonça 1201 (Ul, Ul); Torre 899 (Ul), 1201 (Ul), 1383 (Ul). Niassa: F. A. Mendonça 737 (Ul); Torre 43 (Ul, Ul); Torre & Paiva 10920 (Ul). Zambezia: Torre 1513 (Ul), 5266 (Ul).

LIPPIA JUNELIANA (Moldenke) Troncoso

Additional bibliography: Moldenke, Phytologia 12: 196, 235—237, 240, 357, & 358. 1965.

LIPPIA LACUNOSA Mart. & Schau.

Additional bibliography: Moldenke, Phytologia 12: 238—239 & 445 (1965) and 13: 353. 1966.

Turczaninow (1863) describes his L. cordata as follows: "L. caule fruticoso tetragono, apice ramoso viscido-pubescente; foliis oppositis brevissime periolatis, cordato-oblongis, supra lucidis bullatis parce piliferis, subtus reticulato-rugosis densius vestitis pallidioribus; capitulis axillaribus (cum pedunculis) foliis brevioribus et aliis ad apicem ramorum congestis brevissime pedunculatis, folia non superantibus. Capitula primo minora, postea excrescunt ad magnitudinem L. lupulinae. Bracteae in sicco fuscescentes, in capitulis junioribus floribus breviores, dein illos omnino tegentes. L. Gardnerianae, e descriptione hujus, valde similis, at folia petiolo etiamsi brevissimo, tamen manifesto insident, obtusa nec acuta, bracteae praeter inferiores obtusae."

Heringer reports the leaves and flowers to be fragrant.

Additional citations: BRAZIL: Brasilia: Heringer 9195/389 (N).

LIPPIA LANTANIFOLIA F. Muell.

Additional bibliography: Moldenke, Phytologia 12: 194 & 240. 1965.

LIPPIA LASIOCALYCINA Cham.

Additional bibliography: Moldenke, Phytologia 12: 240—242 & 349. 1965; Moldenke, Résumé Suppl. 12: 4. 1965.

Recent collectors refer to this plant as a shrub, 2 m. tall, with fragrant flowers and pale-purple corollas, flowering in August, and growing on sandstone. Castellanos 24347 is said to have had "rose" corollas

Additional citations: BRAZIL: Bahia: Castellanos 24347 (Ac, Ac). Goiás: Prance & Silva 58522 (N). Maranhão: N. T. Silva 57775 (N).

LIPPIA LASIOCALYCINA var. SAINTHILAIREI Moldenke

Additional bibliography: Moldenke, Phytologia 12: 242, 252, & 349. 1965.

LIPPIA LIBERIENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 12: 254—255. 1965; Moldenke, Résumé Suppl. 12: 2. 1965.

LIPPIA LINDMANII Briq.

Additional bibliography: Moldenke, Phytologia 12: 255—256 & 268. 1965.

LIPPIA LONGEPEDUNCULATA Kuntze

Additional bibliography: Moldenke, Phytologia 12: 257—260 (1965) and 13: 14 & 29. 1966.

Additional citations: PARAGUAY: T. Rojas s.n. [Hassler 2592] (Ca—950440).

LIPPIA LUCENS Standl.

Additional bibliography: Moldenke, Résumé Suppl. 12: 2. 1965; Moldenke, Phytologia 12: 262—264 (1965) and 12: 504. 1966.

Additional citations: HONDURAS: Comayagua: Yuncker, Dawson, & Youse 6003 (Dp, Mi), 6387 (Bt, Dp, Mi).

LIPPIA LUPULIFORMIS Moldenke

Additional bibliography: Moldenke, Phytologia 12: 264—265. 1965; Moldenke, Résumé Suppl. 12: 6. 1965.

LIPPIA LUPULINA Cham.

Additional & emended bibliography: Turcz., Bull. Soc. Nat. Mosc. 36 (2): 204 & 205. 1863; Greenm., Field Mus. Publ. Bot. 2: 341. 1912; Moldenke, Résumé Suppl. 12: 4, 5, & 10. 1965; Moldenke, Phytologia 12: 256, 265—272, & 360 (1965) and 12: 502. 1966.

Turczaninow (1863) describes his L. clausseni as follows: "L. caule fruticoso tetragono, molliter piloso; foliis oppositis brevissime petiolatis utrinque obtusis grosse crenatis, in utraque pagina densiuscule pubescentibus; capitulis axillaribus solitariis folio (cum pedunculo) longioribus. Bracteae magnae roseae, capitula illis L. lupulinae majora."

Additional citations: BRAZIL: Brasilia: Heringer 7873/67 (N). Paraná: Reiss 12 (Mi); Reitz & Klein 17516 (Ac).

LIPPIA LUPULINA var. PARAGUARIENSIS Chod.

Emended synonymy: Lippia renifolia Turcz., Bull. Soc. Nat. Mosc. 36 (2): 204—205. 1863.

Additional & emended bibliography: Turcz., Bull. Soc. Nat. Mosc. 36 (2): 204—205. 1863; Moldenke, Phytologia 12: 272. 1965; Moldenke, Résumé Suppl. 12: 4, 5, & 10. 1965.

Turczaninow (1863) describes his L. renifolia as follows: "L. caule fruticoso teretiusculo cano-pubescente; foliis oppositis sessilibus, subrotundo-reniformibus obtusis, sinu profundo, superioribus subimbricatis, a basi ipsa grosse crenatis, supra bullato-rugosis pubescentibus, subtus reticulatis densius vestitis; capitulis breve pedunculatis subterminalibus. Capitula minora quam in L. lupulina, in statu sicco bracteis fuscescentibus obvallata." He classifies it in Section Rhodolippia.

LIPPIA MARRUBIIFOLIA Reichardt

Additional bibliography: Moldenke, Phytologia 12: 273—274 & 437. 1965; Moldenke, Résumé Suppl. 12: 4. 1965.

LIPPIA MARTIANA Schau.

Additional bibliography: Moldenke, Résumé Suppl. 12: 4. 1965; Moldenke, Phytologia 12: 274—275, 310, 355, & 455 (1965) and 12: 496. 1966.

The Regnell III.942 [25/10/1848] distributed as L. martiana is

actually L. sidoides Cham.

Additional citations: BRAZIL: Brasilia: De Jesus s.n. [Campus de U.N.B.] (N).

LIPPIA MATTOGROSSENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 12: 276--277. 1965.

Additional citations: BRAZIL: Goiás: E. Y. Dawson 14864 (Z--photo).

LIPPIA MEGAPOTAMICA Spreng.

Additional bibliography: Moldenke, Phytologia 12: 277--278. 1965; Rambo, Pesquis. Bot. 21: 58. 1965.

LIPPIA MICROCEPHALA Cham.

Additional bibliography: Moldenke, Résumé Suppl. 12: 4. 1965; Moldenke, Phytologia 12: 278--281 & 363. 1965.

Additional citations: BRAZIL: Brasilia: Sucre 284 (Z).

LIPPIA MICROMERA Schau.

Additional bibliography: Neal, In Gard. Hawaii, ed. 2, 724. 1965; Moldenke, Phytologia 12: 281--287, 332, 333, & 339. 1965; Moldenke, Résumé Suppl. 12: 2 & 3. 1965.

LIPPIA MICROMERA var. HELLERI (Britton) Moldenke

Additional bibliography: Moldenke, Phytologia 12: 283--286, 332, & 339. 1965.

LIPPIA MICROMERA var. PALUDICOLA Moldenke

Additional bibliography: Moldenke, Phytologia 12: 286--287. 1965.

Castellanos describes the plant as aromatic, with white flowers, blooming in July.

Additional citations: BRAZIL: Bahia: Castellanos 25101 [Herb. Cent. Pesq. Florest. 3870] (Z).

LIPPIA MICROPHYLLA Cham.

Additional bibliography: Moldenke, Résumé Suppl. 12: 10. 1965; Moldenke, Phytologia 12: 287--289, 355, & 440 (1965), 12: 486 & 487 (1966), and 13: 26. 1966.

Additional citations: BRAZIL: Bahia: Castellanos 25108 [Herb. Cent. Pesq. Florest. 3877] (Ac). Maranhão: Castellanos 25356 [Herb. Cent. Pesq. Florest. 4125] (Ac).

LIPPIA MODESTA Briq.

Additional bibliography: Moldenke, Phytologia 12: 289--291 (1965) and 13: 12. 1966.

LIPPIA MORITZII Turcz.

Additional bibliography: Moldenke, Phytologia 12: 291--292 (1965) and 12: 484--486. 1966.

Turczaninow (1863) classifies this species in Section Zapania.

LIPPIA MORONGII Kuntze

Additional bibliography: Rambo, Pesquis. Bot. 21: 28 & [59]. 1965; Moldenke, Phytologia 12: 293—297, fig. 1—12, 347, & 434 (1965) and 13: 15, 29, & 30. 1966.

Illustrations: Moldenke, Phytologia 12: 295—296, fig. 1—12. 1965.

The L. angustifolia of Chodat, mentioned in the synonymy of this species, belongs in the synonymy of L. tristis Briq.

Rambo (1965) cites Herb. Anchieta 25783 from Rio Grande do Sul, collected by himself. He describes the plant as a "Shrub, up to 50 cm high", growing on "Dry, more or less open grassy Campos.... One only findplace on the southwestern plains" in that state. He gives the general distribution of the species "From Mattogrosso through Paraguay and northeastern Argentina to western RGS [Rio Grande do Sul], and Uruguay."

LIPPIA MULTIFLORA Moldenke

Additional bibliography: Moldenke, Phytologia 12: 297—300, 448, 458, & 459. 1965.

LIPPIA MULTIFLORA var. PUBESCENS Moldenke

This taxon is now reduced to synonymy under L. savoryi Meikle.

LIPPIA MYRIOCEPHALA Schlecht. & Cham.

Additional bibliography: P. C. Standl., Field Mus. Publ. Bot. 3: 403. 1930; H. B. Davis, Life & Works Pringle 81, 668, & 669. 1936; Moldenke, Phytologia 12: 278 & 300—303 (1965), 12: 486 (1966), and 13: 34 & 35. 1966.

Raven & Breedlove found this plant growing on slopes with an old milpa. Standley (1930) suggests that L. yucatana Loes. may be referable here as a synonym, but I regard it as a distinct species.

Lippia myriocephala has been found in fruit in October. The Dressler & Jones 190, Molina R. 11277 & 11330, and J. Rzedowski 18956, distributed as L. myriocephala, are actually L. hypoleia Briq.

Additional citations: MEXICO: Chiapas: Raven & Breedlove 20118 (Ac). San Luis Potosí: J. Rzedowski 8345 (Ip, Ip).

LIPPIA MYRIOCEPHALA var. INTEGRIFOLIA Loes.

Additional bibliography: Moldenke, Phytologia 12: 302 & 303. 1965.

Tucker describes this plant as a spreading tree, 4.5 m. tall, with white corollas, the throat yellow within, flowering in January, and inhabiting the north slopes of the "highest peak" at 1320-1380 meters altitude.

Additional citations: EL SALVADOR: Morazán: Tucker 793 (Mi).

LIPPIA NIGERIENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 12: 298, 304—306,

458, & 459. 1965; Moldenke, Résumé Suppl. 12: 5 & 6. 1965.

LIPPIA NIGERIENSIS var. BREVIPEDUNCULATA Moldenke

This taxon is now reduced to synonymy under L. savoryi Meikle.

LIPPIA OATESII Rolfe

Additional bibliography: Wild, Kirkia 5: 4. 1965; Moldenke, Résumé Suppl. 12: 7. 1965; Moldenke, Phytologia 12: 306--307, 352, & 431 (1965) and 13: 171. 1966.

LIPPIA OAXACANA Robinson & Greenm.

Additional bibliography: H. B. Davis, Life & Works Pringle 136, 187, 668, & 669. 1936; Moldenke, Phytologia 12: 307--308. 1965.

LIPPIA OBSCURA Briq.

Additional bibliography: Moldenke, Phytologia 12: 275 & 309--311. 1965.

Recent collectors have encountered this species in secondary woods, pastures, and cerrado (open scrub), on rock outcrops, and ruderal, at 840--860 meters altitude, flowering in January.

Additional citations: BRAZIL: Paraná: Smith, Klein, & Hatschbach 14604 (Ac), 14637 (Ac). PARAGUAY: Hassler 8016 (Mi--isotype).

LIPPIA ORIGANOIDES H.B.K.

Additional bibliography: Moldenke, Résumé Suppl. 12: 10. 1965; Moldenke, Phytologia 12: 283, 286, 310--312, 331--334, 339, 346, 446, 452, & 454 (1965), 12: 496 (1966), and 13: 164. 1966.

Breteler describes this plant as a shrub, 1.5 m. tall, with grayish-brown bark, dull pale-green leaves, and white corollas, yellow-orange in the throat, growing with other shrubs on dry southern slopes in poor rocky soil, at 1150 m. altitude, flowering in October. Cuatrecasas & Jaramillo refer to it as a subshrub, with spreading branches, grayish leaves, and corolla and fruit lilac, growing on arid clayish hills, from 2550 to 2700 meters altitude. The Martius 1037, distributed as L. origanoides, is actually L. velutina Schau.

Additional citations: COLOMBIA: Cundinamarca: Cuatrecasas & Jaramillo 26688 (W--2455980). Magdalena: H. H. Smith 587 (Mi). VENEZUELA: Mérida: Breteler 3205 (N).

LIPPIA OXYCNEMIS Schau.

Additional bibliography: Moldenke, Phytologia 12: 334--335. 1965.

The flowers on Sucre 750 are said to have been "lilac".

Additional citations: BRAZIL: Brasilia: Sucre 750 (Ac).

LIPPIA OXYPHYLLARIA (Donn. Sm.) Standl.

Additional bibliography: Moldenke, Résumé Suppl. 12: 2. 1965; Moldenke, Phytologia 12: 336--337 (1965), 12: 503 & 504 (1966), and 13: 162. 1966.

LIPPIA PALMERI S. Wats.

Additional bibliography: Moldenke, Résumé Suppl. 12: 2 & 10. 1965; Moldenke, Phytologia 12: 332 & 337—342 (1965) and 13: 355. 1966.

Recent collectors have found this plant growing in rocky desert washes, at 225 feet altitude. The Guzmán Huerta H.331 and I. L. Wiggins 5539, distributed as L. palmeri, are perhaps better regarded as representing var. spicata Rose.

Additional citations: MEXICO: Baja California: Wiggins & Ernst 576 (Mi).

LIPPIA PALMERI var. SPICATA Rose

Additional bibliography: Moldenke, Phytologia 12: 332 & 339—342. 1965; Moldenke, Résumé Suppl. 12: 2 & 10. 1965.

Wiggins describes the flowers of this plant as "in small stout spikes", and found it growing along dry washes, blooming in April. Guzmán Huerta found it in fruit in January and identified it as L. palmeri S. Wats.

Additional citations: MEXICO: Baja California: Guzmán Huerta H. 331 (Ip); I. L. Wiggins 5539 (Mi).

LIPPIA PEARSONI Moldenke

Additional bibliography: Moldenke, Phytologia 12: 342—343. 1965; Moldenke, Résumé Syppl. 12: 6. 1965.

LIPPIA PEARSONI var. SESSILIS Moldenke

Additional bibliography: Moldenke, Résumé Suppl. 12: 6. 1965; Moldenke, Phytologia 12: 343. 1965.

LIPPIA PEDUNCULATA H. H. W. Pearson

Additional bibliography: Moldenke, Phytologia 12: 343—344, 358, & 462 (1965) and 13: 174. 1966.

The E. E. Galpin 578, in part, distributed as L. pedunculata, is actually L. wilmsii H. H. W. Pearson.

LIPPIA PENDULA Rusby

Additional bibliography: Moldenke, Résumé Suppl. 12: 5. 1965; Moldenke, Phytologia 12: 333 & 345—346 (1965) and 12: 505. 1966.

LIPPIA PHRYXOCALYX Briq.

Additional bibliography: Moldenke, Phytologia 12: 347—349. 1965; Moldenke, Résumé Suppl. 12: 4. 1965.

LIPPIA PICKELII Moldenke

This taxon is now regarded by me as L. recolletae var. pickelii (Moldenke) Moldenke, which see.

LIPPIA PLICATA J. G. Baker

Additional bibliography: Moldenke, Résumé Suppl. 12: 5—7, 10, & 11. 1965; Moldenke, Phytologia 12: 350—354 & 431 (1965) and 12: 483. 1966; Moldenke, Résumé Suppl. 13: 4. 1966.

LIPPIA PLICATA var. ACUMINATA (Moldenke) Moldenke

Additional bibliography: Moldenke, Phytologia 12: 352--353. 1965; Moldenke, Résumé Suppl. 12: 5--7 & 11 (1965) and 13: 4. 1966.

Recent collectors describe this plant as a shrub or subshrub, 2--3 m. tall, growing on rocky deserts among granite boulders and near rivers, at 1450 m. altitude, flowering in March, fruiting in September. The corollas on Torre & Paiva 11072 are described as having been "white". Material has been misidentified and distributed in herbaria as Lantana sp.

Additional citations: PORTUGUESE EAST AFRICA: Niassa: R. Monteiro 35 (Ul). Tete: Torre & Paiva 11072 (Ul).

LIPPIA PLICATA var. PARVIFOLIA (Moldenke) Moldenke

Additional bibliography: Moldenke, Phytologia 12: 353--354. 1965; Moldenke, Résumé Suppl. 12: 5, 6, & 11. 1965.

LIPPIA POHLIANA Schau.

Additional bibliography: Moldenke, Phytologia 12: 354--355 (1965) and 12: 494. 1966.

LIPPIA PRETORIENSIS H. H. W. Pearson

Additional bibliography: Moldenke, Phytologia 12: 344, 357--359, 436, & 461 (1965) and 13: 173. 1966.

LIPPIA PRIMULINA S. Moore

Additional bibliography: Moldenke, Résumé Suppl. 12: 4 & 5. 1965; Moldenke, Phytologia 12: 359--360. 1965.

LIPPIA PRINGLEI Briq.

Additional bibliography: P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1246. 1924; Moldenke, Résumé Suppl. 12: 10. 1965; Moldenke, Phytologia 12: 360--365 (1965) and 13: 7, 35, & 162. 1966; Moldenke, Résumé Suppl. 13: 1. 1966.

Standley (1924) reduces this species to synonymy under L. umbellata Cav., but I feel that the two taxa are abundantly distinct. Recent collectors have found L. pringlei in mesophytic woods with Carpinus, in secondary matorrales, and on the banks of large permanent creeks, at 250--1900 meters altitude, describing it as a shrub, 2.5--3 m. tall, or a tree, 15--20 feet tall. Feddema refers to it as an "occasional tree, along pastured area" on karstic limestone outcrops in open woodland at 2000 m. altitude. Rzedowski & McVaugh describe the bracts as "amarillento-verdoso pálido" and found the species growing on "calizas kársticas con vegetación de matorral secundario". McVaugh found it on steep rocky hills with Acacia, Guazuma, and Bursera at 1100 m. altitude, the "bracts conspicuous, greenish yellow; corolla yellow".

Material has been misidentified and distributed in herbaria as L. chrysantha Greenm.

Additional citations: MEXICO: Guerrero: Feddema 2868 (Mi); Rze-

dowski & McVaugh 307 (Mi). Jalisco: Diguet 457 (Mi). Morelos: Paray 3014 (Ip). Nayarit: J. Rzedowski 15630 (Ip, Mi). Oaxaca: R. McVaugh 22282 (Mi); J. Rzedowski 19280 (Mi). Puebla: Mercado s.n. [Mayo 1945] (Ip). Sinaloa: Breedlove 1572 (Mi).

LIPPIA PUMILA Cham.

Additional bibliography: Moldenke, Résumé Suppl. 12: 4. 1965; Moldenke, Phytologia 12: 367, 429--430, & 439 (1965) and 13: 4 & 5. 1966; Moldenke, Résumé Suppl. 13: 3. 1966.

Recent collectors have found this plant growing on campos, in low or low pastured woods, and in bogs, at 900--1000 meters altitude, flowering from October to December. Smith & Klein 13343 and Smith & Reitz 12853 are said to have had yellow flowers. Material has been misidentified and distributed in herbaria as Verbena sp.

Additional citations: BRAZIL: Santa Catarina: Smith & Klein 13343 (W--2451601), 13786 (W--2451604); Smith & Reitz 12853 (W--2451600).

LIPPIA RAMBOI Moldenke

Additional bibliography: Rambo, Pesquis. Bot. 21: 28 & [59]. 1965; Moldenke, Phytologia 12: 431--432. 1965.

Rambo (1965) cites Herb. Anchieta 11569 [Buck s.n.], 46306, 52156, & 54583 from Rio Grande do Sul, all collected by himself except where otherwise designated. He describes the plant as a "Woody shrub, 2 m high", growing in "Dense Araucaria forest in moist places.....Along the southern rim of the northeastern Highlands only" in that state, with a general distribution of "So far, RGS [Rio Grande do Sul] only".

LIPPIA RECOLLETAE Morong

Additional bibliography: Moldenke, Phytologia 12: 432--434 (1965) and 12: 505. 1966; Moldenke, Résumé Suppl. 13: 3 & 7. 1966.

LIPPIA RECOLLETAE var. PICKELII (Moldenke) Moldenke

Synonymy: Lippia pickelii Moldenke, Lilloa 5: 424--425. 1940.

Additional bibliography: Moldenke, Phytologia 12: 349--350 (1965) and 13: 364. 1966; Moldenke, Résumé Suppl. 13: 3 & 7. 1966.

Citations: PARAGUAY: Hassler 11040 (Ca--950509--isotype, N--isotype, N--isotype, N--photo of type, N--photo of isotype).

LIPPIA REHMANNI H. H. W. Pearson

Additional synonymy: Lippia rehmanni Gürke ex Moldenke, Résumé 316, sphalm. 1959. Lippia rehmannii Gürke ex Moldenke, Résumé 316, in syn. 1959.

Additional bibliography: Dyer, Verdoorn, Codd, & Letty, Wild Fls. Transv. 281, pl. 140, fig. 4. 1962; Moldenke, Phytologia 12: 434--436 & 461 (1965) and 13: 173 & 174. 1966.

Additional illustrations: Dyer, Verdoorn, Codd, & Letty, Wild Fls. Transv. pl. 140, fig. 4. 1962.

LIPPIA RZEDOWSKII Moldenke

Bibliography: Moldenke, Phytologia 12: 478—479. 1966; Moldenke, Résumé Suppl. 13: 1. 1966.

Feddema describes this plant as a shrub, to 1.5 m. tall, the flowers whitish, the throat of the corolla yellow, blooming in November, and growing in disturbed grassland with shrubs in gullies, at 1800 meters altitude.

Citations: MEXICO: Zacatecas: Feddema 2396 (Mi); J. Rzedowski 17635 (Ip--type, Mi—isotype, Z--isotype).

LIPPIA SALVIAEFOLIA Cham.

Additional bibliography: Moldenke, Phytologia 12: 452—456 (1965), 12: 496 & 497 (1966), and 13: 164. 1966.

LIPPIA SAVORYI Meikle

Additional bibliography: Moldenke, Phytologia 12: 458—460 & 462 (1965) and 13: 362 & 363. 1966.

LIPPIA SCABERRIMA Sond.

Additional bibliography: Moldenke, Phytologia 12: 436 & 459—462 (1965) and 13: 173 & 174. 1966.

LIPPIA SCHLIEBENI Moldenke

Additional bibliography: Moldenke, Phytologia 12: 482--484 (1966) and 13: 32. 1966.

LIPPIA SCHLIMII var. GLABRESCENS (Moldenke) Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A.9: 367. 1965; Moldenke, Phytologia 12: 484--486. 1966.

LIPPIA SCLEROPHYLLA Briq.

Additional bibliography: Moldenke, Phytologia 12: 488--492 (1966) and 13: 355. 1966.

LIPPIA SERICEA Cham.

Additional bibliography: Moldenke, Phytologia 12: 492—494. 1966.

The flowers on Sucre 713 are described as having been yellow.

Additional citations: BRAZIL: Brasilia: Sucre 713 (Ac).

LIPPIA SIDOIDES Cham.

Additional bibliography: Rambo, Pesquis. Bot. 21: 58. 1965; Moldenke, Phytologia 12: 495—497 (1966) and 13: 361. 1966.

LIPPIA SUBSTRIGOSA Turcz.

Additional bibliography: Moldenke, Phytologia 12: 501—505 (1966) and 13: 10, 35, 162, & 355. 1966.

Recent collector have found this plant growing in pinewoods and

on steep moist slopes with Quercus and Pinus, fruiting in August, at altitudes of 1000 to 3065 meters, and describe it as a shrub, 1--5 meters tall or a tree 2--6 meters tall, with viscid foliage, "frequent" in Guatemala and "frequent on hills and in matorral" in Honduras, flowering and fruiting in March.

The flowers are described as "cream" on Molina R. & Molina 12116 & 12389, "yellow-cream" on Molina R. 11327, and "yellow" on Molina R. 11290 & 11365.

Additional citations: GUATEMALA: Alta Verapaz: Molina R. & Molina 12116 (W--2445424). Guatemala: Molina R. & Molina 12389 (W--2445425). Huehuetenango: Breedlove 11486 (Ac). HONDURAS: El Paraíso: Molina R. 11327 (W--2445621), 11365 (W--2445628), 11845 (W--2445652). Intibucá: Molina R. & Molina 13931 (W--2445359). Morazán: Molina R. 11290 (W--2445586).

LIPPIA TAYACAJANA Moldenke

Additional bibliography: Moldenke, Phytologia 12: 506 (1966) and 13: 1 & 218. 1966; Moldenke, Résumé Suppl. 13: 3. 1966.

LIPPIA TAYACAJANA var. SESSILIFLORA Moldenke

Bibliography: Moldenke, Phytologia 13: 218. 1966; Moldenke, Résumé Suppl. 13: 3. 1966.

Citations: PERU: Cajamarca: Hutchison & Wright 7025 (Z--type).

LIPPIA TEGULIFERA var. OVATA Briq.

Additional bibliography: Moldenke, Phytologia 13: 3--6. 1966.

Additional citations: PARAGUAY: T. Rojas s.n. [Hassler 9906] (Ca--950431).

LIPPIA TEPICANA Moldenke

Additional bibliography: Moldenke, Phytologia 13: 6--7 & 162. 1966.

LIPPIA TORRESII Standl.

Additional bibliography: Moldenke, Résumé Suppl. 13: 7. 1966; Moldenke, Phytologia 13: 8--10. 1966.

LIPPIA TURNERIFOLIA Cham.

Additional bibliography: Moldenke, Phytologia 13: 12, 14, 15, 26--31, & 168. 1966.

Additional citations: BRAZIL: Paraná: Reitz & Klein 17722 (W--2465579).

LIPPIA UMBELLATA Cav.

Additional bibliography: Moldenke, Phytologia 13: 162--163, 178, & 179. 1966.

King & Soderstrom found this plant growing on pinewood slopes and in meadows at altitudes of 8900--9000 feet and describe it as a tree, to 5 m. tall, in shaded areas, the flowers yellow and the bracts light-green. A wood sample accompanies their no. 5161.

BOOK REVIEW

Otto Degener

In 1959 G. C. Ruhle published a 94-page "Haleakala Guide", with a colored photograph of the silversword (Argyroxiphium sandwicense DC.) native to the Island of Maui. Now appears a companion booklet of 72 pages, "Waimea Canyon and Kokee, A Nature Guide" (Kauai Publishing Co., Lihue, Hawaii, $1.50), with a color photograph of the Kauai silversword (Wilkesia gymnoxiphium A. Gray). The author is Thelma A. Hadley, and her sponsor the "Hui O Laka".

This booklet does not limit itself strictly to northwest Kauai but wisely depicts an informative map of the entire island. It describes climate, geology, soil and topography, trails, legends, birds, mammals and, above all, plants. There are 42 half-tones, that of mist drifts at Kalalau Lookout being particularly lovely.

As in so many publications, all typographical and other errors have not been weeded out of the final proof. Though it was permissible in the old days to spell the name either "Honoruru" or "Honolulu", it is not now permissible to spell "crutches" for "clutches", as appears on page 60. What raises the hackles of an old biologist like the reviewer, however, is the word "animal" used for "mammal" on page 3, "berry" used for "capsule" on page 39, and "trees and plants" used as a heading on page 9 as though a tree were not a plant! "Trees, shrubs and herbs" could have been used or, simply, "Plants". The so-called "broad-leaved cactus" is Opuntia megacantha Salm-Dyck, a plant with tiny, caducous, awl-shaped leaves and a broadened stem. The pukiawe (Styphelia tameiameiae (Cham. & Schlecht.) F. Muell. & S. douglasii (A. Gray) Skottsb.) belongs to the Epacris Family, while the ukiuki (Dianella sp.) belongs to the Lily Family. The silversword is not limited to Maui. David Douglas, before his murder on the slopes of Mauna Kea, Island of Hawaii, by the escaped convict Ned Gurney; used its dry stalks as firewood. Not six native lobelias are peculiar to Kauai, as stated on page 30, but well over 30; and the second paragraph of page 31 obviously applies to Cyanea leptostegia A. Gray rather than to the Dracaena, better called Pleomele.

Zingiber (not Zingeber) zerumbet is a ginger thought to be of ancient introduction by the Polynesians from the South Seas, and is probably about as native to the Hawaiian Islands as are the Hawaiians themselves. The iliahi about the Kokee Museum is Santalum pyrularium A. Gray, with claret flowers; while S. ellipticum Gaud., with greenish-yellow flowers, is mostly a coastal plant of other islands. From the late Earl E. Sherff's monographic study of the lapalapa (Cheirodendron) we know that at least ten kinds are native to Kauai, the species C. platyphyllum (H. & A.) Seem., being endemic to Oahu alone. All are characterized by leaves bearing many leaflets that

tremble in the slightest breeze. The koa of Kauai is not Acacia koa A. Gray but the distinctly Kauai species called Acacia kauaiensis by Hillebrand in 1888 and subsequent botanists.

The author's account of man's stewartship of this wonderful region is most disheartening. With man's silly introduction of the passionflower (Tacsonia mollissima HBK) that smothers native trees, the raspberry (Rubus penetrans L. H. Bailey) and tibouchina (Tibouchina semidecandra Cogn.) that crowd out native shrubs and herbs, the barn owl which is a veritable flying mongoose, the goat and mouflon that browse along dry cliffs and ledges already subject to erosion without four-footed help, and the blacktailed deer that will devastate the endemic bog flora of Waialeale, man is wrecking within less than 200 years a flora that has taken 20 or so million years to perfect. Then, in this Age of the Bulldozer, man proudly slashes a road with his new toy through the endemic jungle from the end of the Kalalau Parking Area around the head of Kalalau Valley. The road leads practically from nowhere to nowhere, and is par excellence the ideal method for destroying the beauty of this entire area by erosion -- in fact, such erosion may promote an eventual break-through between Kalalau Valley and the Waimea Canyon System. May the Lord have mercy on the poor Souls who have contributed to the rape of Kauai's natural resources and beauty!

The present state of Kauai has stimulated in some quarters the current demand that the most interesting and scenic areas remaining of this island be placed under the jurisdiction of the National Park Service. Having observed the malignant changes about Waimea Canyon and Kokee since 1922 during protracted botanical expeditions, the reviewer feels it is too late to expect the Federal Government to pull the chestnuts out of the fire for citizens of Hawaii Nei. Without a king's ransom, Kauai can never be brought back to a natural state within the standard required of a National Park. If the Department of the Interior has reasonable funds available for establishment of a National Park with outstanding Polynesian characteristics, it should concentrate on American Samoa, an area that resembles Kauai before the haole opened his Pandora's box of biological evils.

It is regrettable that the author did not spend a few hours properly checking the scientific names used for possible errors. As it now stands, the "Guide", interesting and informative otherwise, will help perpetuate errors of identification among gullible readers.

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The above review was prepared by Dr. Otto Degener, distinguished author of the monumental "Flora Hawaiiensis" and a lifelong student of the Hawaiian flora.

BOOK REVIEW

Alex D. Hawkes

Venezuelan Orchids Illustrated, Volumes 3 and 4, by G.C.K. Dunsterville & L.A. Garay; 348 pp. + 344 pp., each with 150 pls. plus maps + photographs; 1965 and 1966; Andre Deutsch, London; distributed in USA by Museum Books, Inc., 48 East 43 Street, New York 10017. — $20 per volume

In our time, a great many books dealing with the Orchidaceae have been published. Those under the authorship of Mr. Dunsterville, long a resident of Caracas, dealing with the species of his adopted land, are justifiably among the most famous and widely purchased by connoisseurs.

To date, Mr. Dunsterville has, in his amazingly accurate and truly magnificent plates, taken up 650 kinds of orchids known to inhabit Venezuela. We are assured that an additional two volumes yet remain to be printed, and all of us active in the field look forward to these with great anticipation.

The work of Mr. Dunsterville has received international acclaim since his meticulous drawings and comprehensive descriptions and comments first commenced appearance some years ago. Kudos for his ability is assuredly more than necessary, since he must be counted among the finest critical orchid illustrators of our or any time.

Regrettably, the international opinions regarding his collaborator's ability fall far short of this high opinion. Mr. Garay, some of whose first articles in this country I published in a necessary sort of "translation" from his version as submitted to me, seems to have adopted only a totally autocratic attitude towards his readers who might dare to question his implied total command of the Orchidaceae. His command of English has improved vastly, at least in print, since I received his garbled manuscripts, for he now seems the master of every term of slanderous vituperation in our language, as evidenced by his recent excessive reviews.

Mr. Garay automatically assumes that all of his readers— all of whom know him primarily through the otherwise invaluable Dunsterville volumes— agree with his taxonomic decisions. In his case, in almost every instance, we cannot argue, since he does not deign to explain why his opinions must be accepted by all of us. This is indeed unfortunate, since a number of the orchids which have come to his attention are more or less frequent in cultivation, and indeed are often parents of horticulturally popular, internationally registered hybrids.

All of this is blithely explained away in the Preface to Volume 3 of the present work, where the following truly incredible state-

ments, obviously from Garay's hand, which must be unique in our time, appear, with reference to the "unexplained" (the quotes are from the book) synonyms listed: "It is not customary to reduce various specific epithets to synonymy without explanation, but a glance will show that so many are these synonyms that discussion and explanation of each action would require far more space than could possibly be allotted in these pages. We would like to assure our readers, however, that our judgement in reducing a species to synonym status is in every case based on actual examination of the type specimens."

Venezuelan Orchids Illustrated is a memorable series of volumes, artistically without peer in our time. It seems most unfortunate, though, that Mr. Dunsterville had not allied himself with an orchidologist, rather than with a person who creates his own unique regulations as he goes along.

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BOOK REVIEWS

Alma L. Moldenke

"Native Wild Plants of the Northeastern United States and Canada", by H. F. Montgomery, xxxvi & 193 pp., illustr. Ryerson Press of Toronto and Frederick Warne & Company of New York. 1965. $3.95

This pocket-size book can be a helpful companion out on the trail or on the library shelf. It describes succinctly and illustrates by clear line drawings and two dozen beautiful color photographs almost a tenth of the indigenous plants of the area. The commonest and the showiest among the herbs are chosen. The time of blooming is often noted, but the ranges of the species are not mentioned.

The plants are arranged into families according to Gray's Manual. A fifteen page simple and obvious key directs even untrained plant hunters to the proper sections of the book.

The printing, paper, drawings and photographs are all fine even though the word "aquatic" slipped through misspelled on p. xxiii. There is a simple glossary: nothing more is needed since the author took great pains to simplify the language used.

This book is an effectively popularized path to one phase of the out-of-doors written by an excellent botanist with years of field studies, nature photographing and sketching to his credit.

"Weeds of the Northern United States and Canada", by F. H. Montgomery, xxviii & 226 pp., illustr. Ryerson Press of Toronto and Frederick Warne & Company of New York. 1965. $3.95

This book is a really fine companion volume to the one reviewed immediately above. It therefore belongs in another pocket of the same field jacket or on the same library shelf.

The format is similar - simple language, elementary key, family arrangement, recognizable descriptions of 365 of the most common and/or the most conspicuous "unwanted" plants, clearcut line drawings of almost 300 of them, frequent mention of origins and distribution, helpful glossary.

While the book is enriched with many French-Canadian common names, many from the standardized American list are ignored.

"The Basic Dictionary of Science", edited by E. C. Graham, xvi & 568 pp., illustr. Evans Brothers, Limited, of London and Macmillan Company of New York. 1965. $5.95

This labor of the Orthological Institute "gives the senses of more than 25,000 words and word-groups taken from all branches of Physics, Chemistry, Biology, Medicine, Psychology, Astronomy, Geology, and Anthropology, as well as from important fields of science in industry, such as Engineering, Aeronautics, and Metallurgy" in Basic English and such additional "words as are common to all the important languages at the present-day".

People reading in the various sciences will find this book helpful, quite up-to-date, provided with both American and English spellings wherever they differ, and much more efficient to handle than any huge general dictionary. People with training in the classical languages and linguistics will probably be distressed that derivations are not given.

The botanical sciences seem to be somewhat slighted. As an example on p. 96 "crepuscular" is defined only zoologically, where time of flower opening might also have been mentioned -- but perhaps the definition is clear enough so that its botanical application could be correctly inferred.

"Drawings of British Plants", Part XXII Scrophulariaceae (1), by Stella Ross-Craig, 39 plates & index. G. Bell & Sons, London. 1966. 11s 6d.

Very accurate, beautifully drawn plates are in this paper-covered volume. Besides whole plant illustrations, flower, seed, fruit, root and other parts are show separately with their diagnostic features and accurate magnifications.

May this project continue to be executed with the same or similar scientific accuracy and artistic beauty until all the known plants of this area are so treated!

"Flora of Turkey and the Aegean Islands", Volume I, edited by P. H. Davis, 567 pp., illustr. University Press, Edinburgh, and Aldine Publishing Company, Chicago. 1966. $27.50

This critical, thorough work is the first of eight planned vol-

umes. It covers the pteridophytes, gymnosperms, Ranunculaceae, Paeoniaceae, Nymphaeaceae, Berberidaceae, Papaveraceae, Cruciferae, Capparidaceae, Resedaceae, Cistaceae, Violaceae, and Polygalaceae, with carefully constructed keys, full diagnostic descriptions, synonymy, literature references, habitats, distribution records by word and by many maps, type citations, taxonomic relationships, and some drawings.

This excellent project represents needed scholarship on 902 species, of which 20 percent are endemic, since the last published flora was Boissier's "Flora Orientalis" of 1888, since this area covers three major phytogeographical regions (Euro-Siberian, Irano-Turanian, Mediterranean), and since this locale was the homeland (gene pool) of several of today's western cultivated plants and weeds.

"Chromosomes, Giant Molecules, and Evolution", by Bruce Wallace, xi & 171 pp., illustr. W. W. Norton & Company, New York. 1966. $1.95

The author offers this paperback book as his sword in a duel with the anti-evolutionists; he wants to put it into the hands of intelligent but uncommitted laymen, public school teachers, clergymen and parents. The book has well organized material for these people to read at home or to study in adult education groups, seminars, courses in state teachers' colleges, or biology courses for the non-science majors. I want to emphasize that holders of a doctrine of special creation are becoming fewer and fewer in number, and weaker and weaker in strength. In a score of years almost all of them will be dead. And I want to emphasize, contrary to the author's claim, that such classical evidences for evolution from comparative anatomy, embryology, paleontology, plant and animal breeding, etc. have been effectively convincing. Witness the changes in and the increase of biology texts! This book just adds more modern, convincing evidence in fine form.

The author makes a point of avoiding such terms as "mitosis" and "meiosis", but explains the processes simply. If the terms were added perhaps some hazy concepts from high school days might have been clarified. He might have named the prominent chemicals inducing polyploidy; they appear in newsprint and popular scientific articles. The 39 charts and their explanations are very effective.

"Taxonomic Terminology of the Higher Plants", by H. I. Featherly, 166 pp. Hafner Publishing Company, London & New York. 1965. $4.25

About half of this book consists of a very well defined glossary of a representative, but not sufficient, number of technical terms used in botanical taxonomy, plant distribution and specification. About a quarter of the book follows with an interesting

subject classification with repeated definitions under such topics as - aestivation, corolla, -onyms, stamens, type terminology. Then there are listed almost 2,000 specific epithets with gender endings and their meanings. Eighteen pages of Greek and Latin components with their meanings and cognates can be particularly helpful to our increasing number of students without formal training in classical Latin and Greek. Perhaps this material would have been more useful if it were introduced with the definitions. An appendix has concise explanations of floral evolution, basic scientific laws and hypotheses, and phyllotaxy.

The paper of this review copy is poor and very dry. The printing is clear and quite free of errors, although "original" is misspelled on p. 158.

The book would be really helpful only to beginning or transient students in the field of taxonomic botany.

"Floral Biology", by Mary S. Percival, xv & 234 pp., illustr. Pergamon Press, Oxford, London, Edinburgh, New York, Paris, Frankfurt. 1965. $3.85

This paperback book is a delightful and thoroughly scientific survey of the science of flower life which lasts from the first pollen dehiscence of the first ripening stamen and/or the inception of pollen receptivity by the first stamen until the end of these activities. It reviews the literature from Sprengel's landmark publication of 1793 up to current research. It covers for flowers - sex, structure, isolation mechanisms, use as animal food, and pollination of the following types - anemophilous, hydrophilous, ornithophilous, cheiropterophilous, entomophilous. There are even two records of rain pollination and the mention of doubtful malacophily. Finally, there is a short chapter on practical work in floral biology. The paper, printing, illustrations and indexes are excellent.

This book is a gem for the general reader of scientific interests and for biology course enrichment on both the secondary and university levels.

"Laboratory Manual for Plant Anatomy", by Richard A. Popham, vii & 228 pp., illustr. C. V. Mosby Company, St. Louis, Missouri. 1966. $4.95

So many of the printed and mimeographed lab manuals in use over the last hundred years on our campuses have been worse than worthless because they are any one or more of the following - stultifying, catechetical, superficial, moribund, time-stealing repositories of endlessly inaccurate drawings. This one is different! It starts with a wise foreword quote - "The good observer is one who sees what he is not looking for and who does not see what he is looking for if it is not there" - and so orients instructors and students on a more truly scientific approach.

Proper vocabulary is stressed at the start of each topic, with the students hunting up meanings or depending upon class lectures.

Fine photomicrographs and drawings are given for student labeling in a variety of ways on their own study time: but one good drawing should be required. The many questions asked are thought-provoking, organizing, exploring. The topics are covered developmentally and include roots, stems, leaves, and germinating seeds. Outside of a flower bud section, nothing is shown on flower or fruit structure. Why?

It is good to note that species names are given along with the generic ones under the illustrations. The instructor should surely let the students know what these plants are since several may be passed daily on the campus. The author should have had a taxonomic botanist check on the validity of the names used, for then certainly "Clerodendrum" would have been employed instead of "Clerodendron", "Pinus nigra var. poiretiana" would have been used instead of "Pinus laricio", etc. A much wider range of plants is shown here than usually appears in such a text or manual. References are well arranged according to topics, but no mention of Nehemiah Grew's classic work is given.

"The Plant Kingdom, a Laboratory Manual", edition 2, by Paul C. Lemon & Norman H. Russell, viii & 215 pp., illustr. C. V. Mosby Company, St. Louis, Missouri. 1965. $3.90

This is a typical, well illustrated, looseleaf lab manual, planned as a companion to Russell's "An Introduction to the Plant Kingdom" by the same publishing house, and claimed to be usable with any other modern text which has an evolutionary approach.

It has the usual stereotyped questions and answers blanks. It uses didactically a not very modern system of plant classification. Hopefully the class lectures will impart to the students the concepts of system and systems, and the fact that the latter are not as static as a page outline makes them.

Squeezed in at the end of the book are a few lab exercises on photosynthesis and fermentation, as well as some field exercises in ecology, all similar to those done with the brighter classes in our present-day high schools.

Reference sources given at the end of each exercise unit are well chosen, but there is no mention of Lyman Benson's excellent books on the subject of plant classification.

"Nitrogen Fixation in Plants, by William D. P. Stewart, 168 pp., illustr. Athlone Press in London & Oxford Press in Toronto & New York. 1966. $4.00

This compact outgrowth of university lectures explains with excellent clarity the nature, physiology, and biochemistry of the utilization of molecular nitrogen for cell protein and protoplasm symbiotically in legumes and certain non-legumes and by free-living bluegreen algae and bacteria. There are reports of field studies with bluegreen algae as green manure on rice fields, for example. There is a fine bibliography.

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A NEW KARWINSKIA (RHAMNACEAE) FROM NORTHERN COLOMBIA.

Armando Dugand
Barranquilla, Colombia
and
Marshall C. Johnston
University of Texas Herbarium, Austin, Texas

The following is part of a taxonomic study of the flora of the semi-arid areas on the Caribbean Coast and the lower Magdalena Valley in northern Colombia, South America, in which the senior author has been engaged for many years.

During the last ten months he has had the opportunity of critically studying his own botanical gatherings as well as those made by several other collectors and botanists who have visited that section of Colombia and the adjoining areas in northern Venezuela and Panama. This part of the study has been made possible through a Fellowship grant from the John Simon Guggenheim Memorial Foundation, to the Directors and Trustees of which he is deeply indebted. The senior author also wishes to acknowledge very gratefully the courtesies extended to him by the Chairman of the Department of Botany, the Curator in Charge of the division of Phanerogams, the Associate Curators and other staff members of the United States National Herbarium, Smithsonian Institution, Washington, D.C.

The junior author acknowledges the assistance of a grant from the Michaux Fund of the American Philosophical Society in his study of Karwinskia and other Rhamnaceae.

KARWINSKIA COLOMBIANA Dugand & M.C. Johnston, sp. nova - Arbuscula usque ad 5 m. alta, trunco basi usque ad 27 cm. diam. Cortex ramulorum annotinorum grisei-brunneus, lenticellatus. Ramuli hornotini oppositi, graciles, fusci, propter ipsorum intorsionem eodem fere plano jacentes, tempore florendi flagelliformes 6-9 cm. longi, 0.5 - 1 mm. crassi, internodiis 3 ad 5 praediti, sparsim minuteque hirtelli aut inferioris internodiis glabrati. Petioli ob torsionem internodiorum eodem fere plano omni porrecti potius quam sane decussati. Folia inter se haud remota marginibus persaepe sese attingentia, lamina membranacea basi rotundata, margine integerrima, glandulis punctiformibus microscopicis nigris interdum oblongis secus marginem numerosis, inter nervos transversales sparsissimis vel nullis et circa laminae apicem fere nullis. Laminarum magnitudo atque figura a foliis nodorum proximalium ad illa e nodis distalibus ramulorum hornotinorum orta variat: proximalia folia enim laminam saepe suborbicularem interdum fere obovatam praebent 10-17 mm. longam, 10-15 mm. latam, saepius apice emarginatam vel rotundatam; illa e medianis internodiis orta ovatam figuram 25-45 mm. longam, 20-25 mm. latam apice subacutam vel obtusam vel rotundatam exhibent; folia summa ex internodiis quarto et quinto oriunda anguste ovata sunt, 35-62 mm. longa, 17-28 mm. lata apice acutissima vel breviter acuminata vel acute apiculata; omnia supra atroviridia in

sicco saturate olivacea vel fuscescentia, subtus valde pallidiora subglauca nervis pinnatis conspicuis at vix prominulis ornata. Folia intermedia atque distalia ramulorum hornotinorum nervis secundariis 6-8 tenuibus utroque latere e costa media sub angulo 20-45° divergentibus strictis vel leniter arcuatis et fere usque ad marginem eleganter parallelibus, juxta eam camptodromis. Nervi tertiarii ceterique crebri, tenerrimi, oculo armato conspicui arcteque reticulati subpellucidi. Petiolus 4-7 mm. longus primum juventute minute parceque hirtellus denique glabratus. Stipulae subulatae, hirtello-pilosulae, ca. 1 mm. longae, caducae.

Cymae umbelliformes axillares 2-4-florae, pedunculo 1-3 1/2 mm. longo sparse minuteque hirtello, pedicellis ad anthesin 2-3 mm. longis, postea ad 4-5 mm. protractis, sparse minute hirtellis denique glabratis. Cupula floralis 2-3 mm. lata, pilosula; sepala deltoidea 1-1 1/2 mm. longa; petala albida ca. 1 mm. longa. Ovarium ut videtur biloculatum, loculo utroque uniovulato.

Type Collection: COLOMBIA: Departamento del Magdalena: valle del Rio Cesare (parte occidental), al oeste de Los Venados (10° N., 73° 42' W.); llanuras subxerofíticas de sabana abierta con "matas de monte" esparcidas (grupos aislados de árboles, arbustos y bejucos), 60 m. sobre el nivel del mar, Abril 23, 1963, A. Dugand 6326 (holotype US; isotypes: COL and others to be distributed).

The only other collection seen by us is COLOMBIA, Departamento del Magdalena, valle del Rio Cesare (parte occidental), bosque subserial tropofítico cerca del Caño Sagarriga, al oeste de Los Venados (10° lat. N., 73° 45' long. W.), 70 m. alt., Abril 21, 1963, A. Dugand 6294 (COL, US, etc.)

This is a small tree with declining branches found rather scatteringly in the small, isolated patches of woodland (locally known as"matas de monte") that dot the otherwise open savannas on the semi-arid plains west of the Rio Cesare, a tributary of the Magdalena River in northern Colombia. The flowers when collected were green color, with the petals paler, almost whitish.

In most species of Karwinskia, the whiplike early-season flowering branches proceed to elongate, producing a dozen or more sterile nodes. This occurs while the drupes at the early nodes are maturing. The leaves at these sterile nodes are more remote, longer, proportionately narrower, firmer and less membranous than those of the flowering nodes. Unfortunately we do not yet have of this new species, K. colombiana, material showing these later stages. In comparing the new species to its close relative, K. Calderonii Standley of Central America, it is necessary to select only the early, flowering specimens of the latter species. Such specimens show, as contrasted to K. colombiana, longer, proportionately narrower (more lanceolate) leaves, those of the most proximal node of the branchlet being 15-45 mm. long and 10-23 mm. broad, of the middle nodes 33-64 mm. long and 13-24 mm. broad, and of the fourth of fifth node 39-80 mm. long

and 16-26 mm. broad; the blades of the middle and distal nodes show more (usually 9 to 12 pairs) lateral nerves than those of K. colombiana and the nerves have a greater tendency to exhibit the alternating stripes of darker and lighter coloration so characteristic of the Mexican Karwinskias. The petioles are 8-11 mm. long, thus longer than those of K. colombiana. Each cyme has 8 to 15 flowers, versus the 2 to 4 flowers found in each cyme of K. colombiana. With all these distinctions, K. colombiana is an adequately distinct species, at least as distinct as various population-complexes which have been considered to be species in Mexico.

Not only is Karwinskia colombiana the first species of this genus to be recorded from Colombia; it is also the first record of Karwinskia for South America. A report of the genus from the Bolivian Chaco was based on a collection of Rhamnidium elaeocarpum.

NOTAS SOBRE LA FLORA DE COLOMBIA Y PAISES VECINOS

Armando Dugand
Barranquilla, Colombia.

La serie de artículos que inicio con estas notas ha de contener algunas de las observaciones más importantes que he hecho en muchos años de excursiones botánicas y de estudios taxonómicos, muy particularmente las que afectan la taxonomía o la nomenclatura de las especies que componen la flora del piso cálido de Colombia, con especialidad la de la Costa del Caribe y la correspondiente llanura infero-magdalénica. En algunos casos estas observaciones atañen también a la flora de los regiones inmediatamente vecinas en el litoral caribe (Venezuela y Panamá) y aun la de países más lejanos del continente suramericano o de la América Central.

Forman parte de un estudio que inicié hace muchos años, interrumpido en demasiadas ocasiones por circunstancias diversas, que contempla no sólo la taxonomía de las especies, sino también el a specto sinecial de ellas en cuanto sean componentes de colectividades definidas (sinecias: formaciones, asociaciones) en el territorio que ha sido teatro principal de mis actividades. Dicho territorio hállase comprendido grosso modo en la llanura costera de Colombia, limitada por el Mar Caribe o de las Antillas, y que se extiende desde el litoral hasta aproximadamente 9° 30' de latitud septentrional, desde la parte norteña del Departamento de Bolivar hasta la península de la Guajira, incluyendo las llanuras que bordean el Bajo Magdalena hasta su desembocadura, y las que se dilatan entre este río y el Cesare.

El e studio critico de mis colecciones ha recibido impulso extraordinario, en muchísimos casos definitivo, gracias a mi estada de más de un año en el Instituto Smithsoniano, de Washington, E.U.A., en cuyo herbario (United States National

Herbarium) hállanse depositadas numerosas e importantísimas colecciones de la región neotropical, y cuya biblioteca botánica es de las más completas en este ramo. Me ha sido posible llevar a buen cabo esta temporada de estudios merced a un Fellowship que me fue gentilmente concedido por la John Simon Guggenheim Memorial Foundation, a cuyo Presidente, Administradores y Fideicomisarios quedo por ésto altamente agradecido.

Deseo también que conste mi agradecimiento sincero a las autoridades científicas del Instituto Smithsoniano, particularmente al Director del Museo de Historia Natural, al Presidente del Departamento de Botánica, al Curador Encargado de la Division de Fanerógamas, a los Curadores Asociados del Herbario Nacional de los EE.UU. y a todos los miembros del personal de estas entidades que de un modo u otro me han prestado su ayuda muy valiosa facilitando grandemente la realización de mi trabajo.

CACTACEAE

ACANTHOCEREUS SICARIGUENSIS Croizat & Tamayo, Bol. Soc. Venez. Cienc. Nat. 11: 75. 1947 (Venezuela: Estado Lara, Sicarigua)

Esta especie de cactácea, sin ser tan numerosa como el pitahayo común de tres filos (A. tetragonus (L.) Hummelinck), hállase con mucha frecuencia en los bosques áridos de la costa colombiana del Caribe desde la Guajira (donde los indios la llaman kachésura) hasta el Departamento del Atlántico, donde se conoce como "cardón de perro". Mis ejemplares se identifican satisfactoriamente con los de Venezuela en el Instituto Botánico de Caracas.

Los tallos o cladodios son primeramente erguidos, luego mas o menos inclinados o arqueados, o también reclinados sobre otros arbustosi; los más largos que he visto tenían entre 80 cm. y 1 m. 60 de longitud. Son en cierto modo heteromorfos, a saber: los tallos inferiores (de 3 a 4 cm. de ancho) tienen 4 o 5 filos (a veces 6) ligeramente ondeados o festoneados; los siguientes (de 2 a 2.5 cm. de lat. y largos de menos de un metro) tienen 3, 4 o 5 alas longitudinales de menos de 1 cm. de alto, ligeramente ondeadas en el filo (el cilindro leñoso interior tiene 0.6-0.8 cm. de diámetro); de estos cladodios salen otros, alargados, unas veces de 4 o 5 filos y 3 a 4 cm. de ancho, otras, veces con sólo 3 filos y anchos de 2 a 3 cm. Y de estos brotan finalmente artejos achatados y ancípites (de sólo dos filos) mucho más cortos (4 a 15 cm. de longitud), pero relativamente más anchos (4.5 a 5.5 cm. de lat.). En ocasiones, de estos tallos achatados surgen cladodios de 3 o 4 filos.

El tallo basilar viejo y subleñoso de estas plantas presenta a manudo mayor numero de filos o "costillas" (6 a 8), pero es casi siempre muy corto.

Las pocas flores que he visto, ya muy marchitas y en mal estado (al parecer son nocturnas), eran de color pajizo blanquzco; su longitud total es de 15-17 cm., el tubo es delgado (0.5 cm. diam.) y cilíndrico desde la base hasta unos 11 a 12 cm. y luego expándese en forma de embudo.

No se ha descrito el fruto de Acanthocereus sicariguensis; yo he visto muy pocos. Uno sin madurar que coleccioné arriba de Salgar (Depto. del Atlántico) era verde, subgloboso, 4 cm. de diámetro, con 9 costillas longitudinales poco prominentes, cada costilla con aréolas flocosas blancuzcas, globulosas, de unos 2 mm. de diam., distantes unas de otras 10-17 mm., y que llevan 5 a 10 aguijoncitos finos o cerditas filiformes blancuzcas, de punta oscura, de distintos tamaños (los mayores no alcanzan a 10 mm.). La pulpa en este fruto inmaturo era blancuzca, los óvulos (o semillas en formación) de igual color.

Las flores y los frutos brotan tanto de los artejos cortos y ancípites como de los alargados y 4-5-gonos.

Los artejos son frecuentemente de color rojizo claro cuando la planta crece en lugares descubiertos muy asoleados, y verdoso pálido cuando se halla a la sombra. En muchas ocasiones, empero, he observado plantas a la sombra o al sol cuyos artejos ostentaban ambos colores o matices intermedios.

Esta especie, muy bien definida por Croizat y Tamayo en su protólogo, tiene cierta afinidad con el A. brasiliensis Br. & Rose, del cual distinguese a simple vista por tener las aréolas espiníferas mucho más cerca unas de otras (generalmente 1 1/2 a 2 cms., a veces 2 1/2 cms., raramente 3 cms.). En A. brasiliensis hállanse a más de 3 cms., frecuentemente a 4 o 5 cms. COLOMBIA. - Atlántico: arriba de Salgar, 40 m., matorrales espinosos, Feb. 1964, Dugand 6706 (US) y 6706-B (US); - Pocos kilómetros al S. de Cascajal, camino a Leña, Feb. 1964, Dugand 6694 (foto en US). Bolivar: Hacienda de Coloncito, near Turbaco, 200-300 m., Nov. 1926, Killip & A.C. Smith 14339 (US). Guajira: al S.E. de Riohacha, Kms. 11 a 12 de la carretera a Maicao, menos de 20 m., Jan. 1964, Dugand 6654, nombre guajiro: "kachésura". Magdalena: valle del rio Cesare, al oeste y sur de Los Venados (10° lat. N., 73° 42 ' long. W.), junto al Caño Sagarriga, 60 m., Feb. 1961, Dugand 5587 (COL).

ACANTHOCEREUS TETRAGONUS (L.) Hummelinck, Succ. 20: 11, 165. 1948; Backeberg, Cact. 4: 1933. 1960); Arnoldo, Zakflora (Curaçao) ed. 2: 99, figs 68, 69, 70. 1964.

Cactus tetragonus L. Sp. Pl. 466. 1763 (Curaçao); non C. tetragonus Willd. 1797.

Cereus tetragonus Miller, Gard. Dict. ed. 8: no. 2. 1768; non Cereus tetragonus Haworth 1812 neque Cereus tetragonus sensu Br. & Rose 1920.

Acanthocereus pentagonus sensu Br. & Rose, Cact. 2: 123. 1920; Hummelinck Med. Bot. Mus. Herb. Utr. 35: 42. 1938 atque auct. plur.

Acanthocereus colombianus Br. & Rose, Cact. 2: 122. 1920 (Colombia: Calamar and Bonda); Backeberg, Cact. 4: 1932. 1960.

Acanthocereus Pitajaya Dugand ex Croizat in Caldasia 7: 135. 1943; non Cactus Pitajaya Jacquin, Enum.23. 1760; Sel. Stirp. Amer. 151.1763.

El Acanthocereus colombianus de Britton y Rose, cuyo Tipo (Pennell & Rusby 23, NY) fue coleccionado cerca de Calamar,

Depto. de Bolivar, en la región costanera del Caribe que estoy estudiando, no se puede distinguir de los ejemplares comunes de herbario del A. tetragonus, sino por el ancho del artejo que constituye dicho Tipo. Tal distinción no es más que un "criterio de herbario", por así decir. En efecto, las plantas de A. tetragonus ostentan frecuentemente artejos terminales y subterminales cuya anchura excede la de 4 a 6 cms. que se observa usualmente en esta especie (ejemplares desecados), pues llega a 7 o 7 1/2 cms. según los que he visto. Por lo tanto no dudo que algunos alcancen los 9 cms. del Tipo de colombianus.

En todo caso, la flor de H.H. Smith 2423 , procedente de Bonda, cerca de Santa Marta, y que Britton y Rose citan como A. colombianus, esidéntica a las de Elias 306 y 1089 (US), Dugand and Jaramillo 3413 (US), 3415 (COL) y Dugand 6794 (US) cuyos artejos corresponden bien a los de ejemplares sin flor como Dugand & Jaramillo 3436 (US), Romero-Castañeda 2074 (COL) y otros.

El número y el tamaño de las espinas radiales y de la única espina central (a veces dos) varía demasiado para que se le tenga en cuenta como carácter distintivo. Radiales he contado desde 3 hasta 8, generalmente 5-6, cuya longitud va desde menos de 0.5 cm. hasta 4 cms.; y la espina central es de 3 a 6 cms. de largo. Los artejos son generalmente trígonos, pero muy frecuentemente tetrágonos. Nunca los he visto pentágonos, excepto raras veces en la base misma de la planta, donde el tallo principal forma tronco leñoso.

Respecto al Cactus Pitajaya de Jacquin, dicho autor dice en el protólogo que el fruto está adornado por fuera con "foliolis aliquot calycinis praemorsis Pereskiae adinstar" y tiene la pulpa blanca; lo cual no corresponde de ningún modo al Acanthocereus tetragonus cuyo fruto no presenta tales "hojuelas" (escamas foliáceas ?) sino aréolas espinulíferas, y además su pulpa es de color rojo vivo. Los pulvínulos espinulíferos del fruto de tetragonus son decíduos y dejan conspícuas cicatrices en la superficie de éste.

Si juzgamos por las tales "hojuelas calicinas" o escamas foliáceas es probable que la Pitajaya de Jacquin pertenezca al genero Hylocereus, como me lo hizo notar en carta reciente que le agradezco la doctora Helia Bravo Hollis, distinguida cactóloga mexicana. Con todo, sin ejemplares auténticos de este concepto no podemos asignarle posición genérica. Yo he recorrido muchas veces los fruticetos litorales de los alrededores de Cartagena y del vecino Departamento del Atlántico y no he encontrado hasta ahora ninguna cactácea terrestre (es decir, no epifítica) de tallos triangulares y cuyo fruto, rojo carmesí por fuera, tenga blanca la pulpa, y además este provisto de escamas foliáceas como las que describe Jacquin.

Según dicho botánico, la época de floración del Cactus Pitajaya es de julio a septiembre. Coincide así con la del Acanthocereus tetragonus, que sin duda alguna es el "cardón de pitahaya" silvestre mas común y conocido en el litoral norteño de Colombia. En muchos lugares áridos de la llanura costera abunda este cardón, que otros llaman simplemente "pitahayo", formando grupos

pequeños y gregales caracterizados por numerosos tallos y artejos muy alargados, ora más o menos erguidos o inclinados, ora arqueados, unos reclinados sobre otros cardones de la misma especie, otros apoyados en las ramas de los arbustos y arbolitos vecinos, o también decumbentes y aun parcialmente acostados sobre el suelo.

Esta misma especie se encuentra por todo el litoral árido de Colombia desde la península de la Guajira (donde los indios lo llaman at'tuno) hasta el Departamento de Bolívar y muy probablemente Córdoba. En el herbario de US hay tambien un ejemplar del Norte de Santander, valle del rio Peralonso, 120 m. (Araque-Molina y Barklay 18 NS 129). Hállase igualmente en la costa de Venezuela y por supuesto en la isla de Curazao, su patria clásica.

ACANTHOCEREUS TETRAGONUS (L.) Hummlk. var. MICRACANTHUS Dugand, nova; distinguituir spinis brevissimis; radialibus quinque sexve atque centrali 0.2-0.4 cm. longis, centrali interdum usque ad 0.7 cm. longa, omnis albidis apice autem infuscatis. Areolae spiniferae inter se 4-5 cm. distantes, ca. 0.7 cm. diam., lanugine brevi albida onustae.
COLOMBIA. - Atlántico: bosque semiárido junto al arroyo de Juan de Acosta; alt. 15 m.; 27 Jan. 1962, Dugand 6018 (herb. Dugand) vulg. "cardón de pitahaya".

En 1962 planté un artejo de micracanthus en el jardín de mi casa; a poco arraigó y ha crecido muy lentamente produciendo cuatro artejos nuevos, de tres cantos como los de la planta original. Todos presentan hasta ahora las espinas brevísimas, inconspícuas, que caracterizan a esta variedad. Noto que los artejos de la planta que cultivo son de color verde más vivo que el que se observa generalmente en el A. tetragonus de espinas largas; pero también he visto en los bosques plantas de micracanthus cuyos tallos tienen el mismo color verdoso claro tirando a grisáceo - y a menudo a rojizo - que distingue a las plantas de tetragonus. No descarto la posibilidad de que micracanthus sea especie distinta, cercana quizás al A. subinermis Br. & Rose, de México.

He observado la mismísima variedad en distintos lugares del Departamento del Atlántico y en las cercanías de Los Venados, Depto. del Magdalena.

PILOSOCEREUS LANUGINOSUS (L.) Byl. & Rowl. in Cact. & Succ. J. Gr. Brit. 19: 67. 1957.
Cactus lanuginosus L., Sp. Pl. ed. I: 467. 1753 (Curacao).
Cephalocereus lanuginosus (L.) Britton & Rose, Contr. U.S. Nat. Herb. 12: 417. 1909.
Pilocereus lanuginosus (L.) Backeberg, Kakt. -ABC 330.1935
Pilocereus colombianus Backeberg, Kakt. -ABC 330. 1935 (quoad planta littoris septentrionalis Colombiae; non Cephalocereus colombianus Rose 1909).
Pilosocereus colombianus Backeberg, Die Cact. 4: 2433. 1960 (quoad pl. litt. septentr. Colomb.; non Cephalocereus colombianus Rose 1909)

Prueba evidente de la confusión que solemos padecer a menudo los que estudiamos cactáceas (y otros grupos), cuando hemos de atenernos únicamente a descripciones insuficientes o a ejemplares de herbario, muchos de los cuales son demasiado fragmentarios o incompletos, es la siguiente: Britton y Rose, al describir a Cephalocereus colombianus (cuyo Tipo procede del valle del Dagua, en el occidente de Colombia) citaron como de esta especie un ejemplar (W.R. Maxon 3845) de Puerto Colombia, en la costa del Mar Caribe; pero más tarde (en The Cactaceae 2: 55-56. 1920) enmendaron esta identificación diciendo que los ejemplares del norte de Colombia, citados en la descripción original de Cephalocereus colombianus, "we now include in Cephalocereus russelianus". En realidad las dos especies son muy distintas !

Backeberg, en su reciente obra (Die Cactaceae 4: 2433-2434, 2449-2450. 1960) tampoco parece estar bien seguro de la identificación de estas cactáceas puesto que a los Pilosocereus de Puerto Colombia los cita como P. colombianus (p. 2434) y a los de la Guajira, como P. lanuginosus (p. 2450). En realidad los de la costa colombiana del Caribe (Puerto Colombia, Sabanilla, Santa Marta y la Guajira) son idénticos a los de Curazao, típicos de lanuginosus.

Backeberg se refiere a la localidad de colombianus así: "von NW-Kolumbien (Venticas del Dagua)", situando erróneamente el valle del rio Dagua en el noroeste de Colombia, cuando lo cierto es que se encuentra al occidente de este pais, en las faldas de la Cordillera Occidental que miran hacia el Océano Pacífico. Puerto Colombia y la península de la Guajira hállanse en la costa norteña de Colombia, o sea la del Mar Caribe.

El número de las costillas caulinares varía no sólo en las plantas de una misma localidad, sino también con bastante frecuencia en los artejos de una misma planta. De ello he podido darmecuenta examinando de cerca las que crecen en los espinares de Sabanilla, cerca de Puerto Colombia. Por lo general son 8 a 10, pero algunos artejos tienen 11 o 12 costillas. Por lo tanto no es posible hacer distinción especifica por el número de costillas caulinares. En cuanto al número de aguijones en las aréolas, yo he contado de 10 a 18 en los de Sabanilla, siendo entre blancuzcos, amarillento pálido y aun amarillos los que se hallan en el tope y la parte superior de los artejos, y grisáceos o parduscos los de la parte media e inferior de estos. Según la descripción original, los ejemplares típicos de P. colombianus tienen 25 aguijones o más en cada aréola, y ciertamente así son los que menciono bajo dicho nombre, en el supuesto algo dudoso de que sean realmente especie distinta.

PILOSOCEREUS COLOMBIANUS (Br. & Rose) Byl. & Rowl., Cact. & Succ. J. Gr. Brit. 19: 3, 66. 1957.; Backeberg, Cact. 4: 2433. 1960 (quoad planta vallis fluminis Daguae in Colomb. occident.)

Cephalocereus colombianus Britton & Rose, Contr. U.S. Nat. Herb. 12: 416. 1909 (Colombia: Depto. del Valle, Cordillera

Occidental, Venticas del "Dugua" [=Dagua], 600-700 m., Feb. 1906, H. Pittier, Tipo).

En la descripción original se sitúa la localidad-tipo en el Departamente del Cauca. Para beneficio de los que no tienen mayor información acerca de la geografía de Colombia, o de sus divisiones político-administrativas, aclaro que hace más de cincuenta años pertenece al Departamento del Valle, segregado del Cauca.

Conforme lo advirtieron los mismos autores (en The Cactaceae 2: 55-56.1920) el ejemplar W.R. Maxon 3845, coleccionado en Puerto Colombia, en la costa del Caribe, no pertenece a su Cephalocereus colombianus sino, dicen ellos, a C. russelianus. Esta última es una especie muy diferente, que coexiste con el Pilosocereus lanuginosus en la región de Puerto Colombia y la Guajira, y aun pertenece a género distinto (Subpilocereus) según Backeberg. En mi estudio de la flora subxerófila de la costa colombiana del Caribe volveré oportunamente sobre ésta y otras especies afines del mismo grupo. Por lo pronto limítome a mencionar abajo dos ejemplares que provienen de la localidad típica de Pilosocereus colombianus: COLOMBIA. - Valle: Dagua Valley, open limestone valley below Dagua, 700-900 m., May 1922, Pennell 5412 (US), 5413(US); - Dagua Valley, Espinal, below Dagua, 600-900 m., open arid slopes, Sept. 1922, Killip & Hazen 11107 (US). Hay en el herbario US excelentes fotografías de esta última planta en su hábitad natural.

EUPHORBIACEAE

CHAMAESYCE MESEMBRYANTHEMIFOLIA (Jacq.) Dugand, comb. nov.

Euphorbia mesembrianthemifolia Jacquin, Enum. 22. 1760, et Sel. Stirp. Amer. 150. 1763 ("Carthagenae in rupestribus maritimis"); Gooding et al. Fl. Barbados 250. 1965.

Euphorbia mesembryanthemifolia Jacquin, Sel. Stirp. Amer. ed. 2: 189. 1780; - Dugand, Caldasia 2 (8): 295. 1943.

Euphorbia buxifolia Lamarck, Enc. Meth. 2: 421. 1786; - Boissier in DC. Prodr. 15 (2): 15. 1862; Fawc. & Rendle Fl. Jam. 4: 336. 1920.

Euphorbia litoralis Kunth in H. et B. Nov. Gen. & Sp. 2: 54. 1817.

Chamaesyce buxifolia (Lam.) Small, Fl. SE. U.S. 711. 1903.

Hace más de veinte años (en Caldasia 2: 295. 1943) adelanté la tésis de que el epíteto legítimo para esta especie es mesembryanthemifolia de Jacquin por cuanto antecede a buxifolia de Lamarck. El hecho de que ambos se aplican a la misma especie fue reconocido por Boissier en 1862, aunque entonces no hizo valer la prioridad del primero.

Recientemente, en su Flora of Barbados (1965, p. 250), Gooding, Loveless y Proctor reconocen la legitimidad del epiteto de Jacquin.

Siguiendo yo el criterio de varios botánicos en lo que respecta al genero Chamaesyce Rafin. 1817 - que otros no

reconocen, o tratan como subgenero de Euphorbia - propongo la combinación nomenclatural que encabeza este artículo. Si bien la grafía original de Jacquin es mesembrianthemifolia, dicho autor la cambió a mesembryanthemifolia en la segunda edición de su obra, publicada aproximadamente en 1780. En efecto, derívase de Mesembryanthemum L., que Linneo escribió originalmente con y (aunque desde el punto de vista filológico lo correcto sería con i) y continuó escribiendo con y en sus obras posteriores.

COLOMBIA. - Magdalena: Santa Marta, seashore, H.H. Smith 1920 (US); San Andrés (Isla): Dec. 1961, Daniel 5634 (US).

CURAZAO. - Near Willemstadt, coral sea beach, March 1913, Britton & Shafer 2933 (US); Rif, March 1952, Arnoldo 2075 (US).

Además he visto numerosos ejemplares de la costa de Venezuela y de las Antillas.

CROTON FRAGILIS Kunth in H. et B. Nov. Gen. & Sp. 2: 75. 1817.

Croton cienagensis Rusby, Descr. 300 N. Sp. S. Amer. Pl. 44. 1920 (plains 5 miles east of Cienaga, Sept., H.H. Smith 368).

Una nota manuscrita de L. Croizat al pie del ejemplar-tipo de C. cienagensis (herb. NY) señala que el Tipo de C. fragilis en Paris tiene hojas mucho más pequeñas. En todo caso - dice Croizat - este último es un ejemplar muy pobre.

Vista la fotografía del Tipo de fragilis, coleccionado por Humboldt y Bonpland en Cumaná, Venezuela, puedo equipararlo fácilmente con ejemplares de idéntico aspecto (Dugand 5660), de las llanuras semiáridas al oeste del Rio Cesare, cuyas hojas tienen apenas 2 a 3 cms. de longitud y 1 a 2 cms. de ancho; igualmente Haught 4155 de las cercanías de Hato Nuevo en el Depto. del Magdalena, y varios de la costa de Venezuela coleccionados por Foster Smith (No. 251) y el Hermano Ginés (Nos. 2967, 2980, 3333). Los hay también intermedios como mi No. 5664 de la misma región del Cesare mencionada arriba, así como H.H. Smith 366 de Santa Marta, y finalmente los hay semejantes al Tipo de cienagensis, tales como Dugand 5820 y 6323, de la misma localidad que mi 5664. El 5820 de mi colección es notablemente idéntico al Tipo de cienagensis.

El extremo mayor de la variación en el tamaño foliar se observa en mi No. 6285, de la región del Cesare, Caño Sagarriga, al oeste de Los Venados; sus hojas miden hasta 12 1/2 cms. de largo por 10 cms. de ancho, el pecíolo alcanza a 3 cms. El menor es mi No. 5660 de una localidad muy cercana a la anterior; en éste, las hojas no exceden de 2 a 3 cms. de longitud por menos de 2 cms. de ancho, con pecíolo de menos de 1 cm.

Los ejemplares de hoja pequeña de mi colección proceden todos de plantas que crecían al descubierto, en lugares asoleados. Los de hoja grande son de plantas más o menos protegidas por la media sombra que reina en el sotobosque subxerofítico.

Todos los ejemplares mencionados arriba hállanse el herbario US y parte de ellos en el COL.

CROTON GUILDINGII Grisebach, Fl. Brit. W. Ind. 38. 1859

Croton bondaensis Rusby, Descr. 300 N. Sp. S. Amer. Pl. 43. 1920.

COLOMBIA. - Magdalena: 6 miles north of Bonda, 100 m., July, H.H. Smith 1467 (ejemplar en flor, Tipo de C. bondaensis Rusby, NY). También citado como Tipo hay un ejemplar con frutos, H.H. Smith 1467, de Masinga, coleccionado en el mes de noviembre (NY, US). Los dos ejemplares citados llevan el mismo número aunque proceden de localidades distintas y fueron coleccionados en épocas distintas del año. Conviene explicar que ambas localidades hállanse en la misma región de Colombia, no lejos de Santa Marta, y muy cerca entre sí.

Otros ejemplares examinados: Atlántico: región de Barranquilla, llanada de Juanmina, 10 m. alt., bosques subxerofíticos, Jul. 1962, Dugand 6101 (COL, US); - Alrededores de Galapa y Baranoa, Jul. 1943, Dugand & Jaramillo 3292 (COL,US).

A mi entender no hay diferencia significante entre los ejemplares antillanos (guildingii) y los de la costa colombiana del Caribe (bondaensis). Eggers 6953 de la isla St. Vincent, en las Antillas Británicas, patria clásica de C. guildingii Griseb., tiene las glándulas del ápice peciolar sésiles (como las describe Grisebach, loc. cit.) o muy brevemente estipitadas. Las de bondaensis son estipitadas. Por lo demás el tamaño de las hojas varía según se trate de ejemplares que crecen al descubierto o en la media sombra del sotobosque subxerofítico, siendo estos últimos los de hoja más grande. En la región costanera colombiana este es un arbusto de 1.50 a 1.80 m. de altura.

MARGARITARIA NOBILIS L.f. var. HYPOMALACA (Standl.) Dugand, comb. nov.

Phyllanthus nobilis var. hypomalacus Standley, Carnegie Inst. Wash. Phub. 461: 68. 1936 (Tuxpeña, Campeche, Mexico).

Phyllanthus antillanus var. hypomalacus (Standl.) Lundell, Phytologia 1: 337. 1939.

Phyllanthus heteromorpha Rusby, Descr. 300 N. Sp. S. Amer. Pl. 42. 1920 (quoad pl. fructif. saltem, H.H. Smith 410).

De acuerdo con Grady L. Webster (Journ. Arnold Arbor. 39: 208. 1958) Phyllanthus antillanus (A. Juss.) Muell.-Arg. (Cica antillana A. Juss. 1824) y Ph. nobilis (L.f.) Muell.-Arg. (Margaritaria nobilis L.f. 1781) son sinónimos y pertenecen propiamente al género Margaritaria L.f. (Suppl. Pl. 66 et 428. 1781), lo cual a mi entender es criterio acertado. Las diferencias importantes entre los dos conceptos genéricos son, según el citado Webster (op. cit. 37: 341. 1956), las siguientes: En Phyllanthus el fruto ábrese completamente en tres "cocas" separadas, la cubierta seminal no es carnosa, ni dura o cartilagínea, y el hilo no es hundido o excavado. El fruto de Margaritaria, por el contrario, no se abre en "cocas" separadas, la cubierta seminal es carnosa por fuera, cartilagínea o huesuda por dentro, y el hilo es profundamente excavado.

He visto un isótipo de la variedad Phyllanthus nobilis hypomalacus de Standley, oriundo de Tuxpeña, Campeche, Mexico (Lundell 897, US), luego transferido por Lundell a la especie antillanus; y he examinado los ejemplares citados por Rusby en el

protólogo de Phyllanthus heteromorpha. Uno de éstos (H.H. Smith 1716) lleva dos indicaciones de localidad distintas, pues según la publicación original es de "6 miles south of Mamatoco, about 400 feet, April 11" y según la etiqueta en el ejemplar mismo (Herb. NY) es de "dry thickets near Masinga, 250 feet, May 30". Los dos lugares hállanse bastante cerca uno del otro al pie de la Sierra Nevada de Santa Marta y a no muchos kilómetros al oriente de la ciudad de Santa Marta, Colombia. Este No. 1716 es masculino, de hojas muy jóvenes y tiernas, y fue expresamente designado como Tipo por Rusby. El otro ejemplar citado en el protólogo (H.H. Smith 410), procedente de Masinga, Jul. 31, tiene frutos y hojas adultas; de él dice Rusby que "cree" que pertenece a la misma especie heteromorpha.

En rigor, el Tipo de este concepto es H.H. Smith 1716 por expresa designación de Rusby. En cuanto al otro (H.H. Smith 410) es ciertamente Margaritaria y bastante semejante - aunque no perfectamente igual - al Tipo de la variedad mexicana hypomalaca descrita por Standley. Las pequeñas discrepancias que se observan débense quizás al diferente grado de desarrollo de las hojas por razón de la edad respectiva en el momento de la colección. En consecuencia creo que son esencialmente idénticos.

Los ejemplares que he coleccionado en el norte de Colombia son todos fructíferos, excepto uno estéril, e idénticos al citado No. 410 fructífero de H.H. Smith. Por la pubescencia menuda y suave del envés foliar - que por cierto es bastante mas pálido (canescente) que la haz - adscribo estos ejemplares a la variedad hypomalaca de Standley. Admito, sin embargo, que este concepto es débil, vista la variación que presentan algunos ejemplares de Honduras, Dept. de Comayagua, coleccionados por A. Molina, cuyo No. 7014 y 7033 son masculinos y de hoja menudamente pubescente, mientras que el No. 7035, femenino, es casi tan glabro como los ejemplares genuinos de nobilis. Intermedio por este concepto es el Tipo de Phyllanthus heteromorpha Rusby, o sea H.H. Smith 1716, aunque por su escasa pubescencia en el envés foliar puede adscribirse a la var. hypomalaca.

COLOMBIA. - Atlántico: bosque marginal del arroyo de Juanmina, camino a La Playa, Jul. 1934, Dugand 654 estéril; - Bosque a la orilla del Rio Magdalena, entre Ponedera y Santa Rita, suelo de aluvión, Sep. 1934, Dugand 694 en fruto. - Magdalena: Santa Marta, in dry forest below 1000 feet, Masinga, July 31, H.H. Smith 410 (US); - Edges of dry forest, 6 miles south of"Mametoca" (=Mamatoco), about 400 feet, April, H.H. Smith 1716 (Tipo de Phyllanthus heteromorpha Rusby, US) masc. en flor;- Bosque sombreado marginal del Arroyo Caraballo, al O. de Fundación, cerca de Retén, Mayo 1935, Dugand 822 en flor; - Valle del Rio Cesare (parte occidental), al oeste de Los Venados (10° N., 73°42' W.), llanuras subxerofíticas, Abril 1963, Dugand 6320 (COL, US) en fruto.

En la costa colombiana del Caribe este arbolito se conoce con los nombres de pelotica, arito y perla. El último débese al aspecto del conjunto seminal, que por su forma esferoide, y el lustre y color blancuzco azulino de su cubierta exterior, tiene alguna semejanza con una perla. Por cierto que Linneo hijo, al describir a Margaritaria nobilis (el nombre del género se deriva

del latín margarita, perla), hizo referencia al mismo hecho ("nucleus... nitidissimus margaritae colore omnium in tota natura").

MARGARITARIA NOBILIS L. f. var. NOBILIS

Margaritaria nobilis L.f., Suppl. Pl. 428. 1781 (quoad pl. foem. tantum); Surinam.

Comparada con su variedad hypomalaca (ver el artículo anterior), cuyas hojas presentan en el envés una ténue pubescencia generalmente suave al tacto, la variedad típica de esta especie es de hojas completamente glabras.
VENEZUELA. - Carabobo: between Morón and Urama, 1920, Pittier 8925 (US); Sucre: southern slopes of Cerro Imposible, 140-200 m., May 1945, Steyermark 62825 (US). TRINIDAD. - Mayaro, Beausejour Estate, June 1908, Broadway 2598 (US) en fruto. BRASIL. - Amazonas: Basin of Rio Madeira, Humayta, near Tres Casas, Sept. 1934, Krukoff 6089 (US) masc. en flor; - Santa Catarina: Sanga de Areia, 250 m., Dec. 1950, Reitz & Klein 9375 (US) en fruto. ECUADOR. - Un ejemplar de Balao (Eggers 14333, US) es quizás referible a nobilis. Dicho ejemplar consiste en dos rámulos separados: uno con flores femeninas, otro con frutos.

PHYLLANTHUS ELSIAE Urban, Repert. Sp. Nov. 15: 405. 1919 (Tobago).

Esta especie, anteriormente confundida con el Ph. acidus (L.) Skeels, ya fue señalada por Webster (Jour. Arnold Arbor. 38: 75. 1957) en el valle magdalénico de Colombia (Bolívar: San Martín de Loba y Magangué; Santander: Puerto Wilches). Hállase con mucha frecuencia en los bosques riparios que se inundan durante la época de las lluvias, cuando se desbordan el rio Magdalena y sus afluentes. También la he hallado muy a menudo en el bosque marginal de algunos arroyos temporarios que cruzan el Departamento del Atlántico. El nombre vulgar es "garbancito" por la figura globulosa del fruto.
COLOMBIA. - Atlántico: entre Palmar de Varela y Ponedera, orilla del rio Magdalena, Marzo 1932, Dugand 3 (Y); misma localidad, Marzo 1933, Dugand 376 (Y); - Confluencia de los arroyos Hondo y León, bosque marginal, Dic. 1963, Dugand 6585 (US); misma localidad, Marzo 1964, Dugand 6746 (US).

La parte interior de la corteza de este arbol es de subido color rosado.

LEGUMINOSAE-MIMOSOIDEAE

ALBIZIA GUACHAPELE (Kunth in H. & B.) Dugand, comb. nov.

Acacia guachapele Kunth in H. et B. Nov. Gen. & Sp. 6: 281. 1823 (cerca de Guayaquil, Ecuador)

Lysiloma guachapele Bentham, Trans. Linn. Soc. 30: 533. 1875

Pithecollobium longepedatum Pittier, Contr. U.S. Nat. Herb. 20:464. 1922 (near Orotina, Costa Rica; Tipo en US)

Samanea samanigua Pittier, Arb. y Arbust. Venez. 4-5 Decad: 54. 1925; Trab. Mus. Comerc. Venez. 90. 1927

Albizzia longepedata Britton & Rose ex Record in Trop. Woods 11: 14. 1927; Woodson & Schery Fl. Panama in Ann. Mo Bot. Gard.

37: 255. 1950.

Pseudosamanea guachapele Harms, Notizbl. 11: 54. 1930; Britt. & Killip, Ann. N.Y. Acad. Sci. 35: 130. 1936.

Comparando la fotografía del Tipo de Acacia guachapele (Humb. & Bonpl. 3805, Herb. Mus. Paris) y un ejemplar de los alrededores de Guayaquil, tipico de esta especie (L. Mille 33, (US), además de uno de la Provincia de Los Rios, Quevedo (Little 6537, US) en el Ecuador, con el Tipo de Pithecollobium longepedatum Pittier, de Costa Rica, y ejemplares auténticos de Samanea saman-igua Pittier, de Venezuela, concluyo que todos representan una misma especie. Comparto la opinión de Mohlenbrock (Reinwardtia 6, pt. 4: 436. 1964) al relegar a Pseudosamanea Harms a la sinonímia de Albizia Durazzini; el hecho de abrirse la legumbre por una sóla márgen, en vez de ambas como ocurre en las típicas Albizias, no me parece suficientemente importante en este grupo para separar a guachapele como género distinto. Puede constituir cuando más una Sección.

Como lo señaló E.L. Little (Amer. Midland Nat. 33: 510. 1945) la grafía original empleada por Durazzini (Mag. Toscan. 3: 10, 11, 13. 1772) fue Albizia a pesar de que el autor manifiesta que dedica este género al Caballero Filippo degl'Albizzi. El hecho de mencionar este nombre en su forma usual italiana con doble z, al tiempo que escribe Albizia con una sola z, repitiendo esta grafía varias veces en su obra, como lo señala Little, demuestra que Durazzini procedió intencionalmente al suprimir una z para "latinizar", digámoslo asi, el apellido Albizzi. En este caso es preciso conservar la grafía original Albizia conforme al Art. 73 del Código, pues no se trata de un simple error ortográfico o tipográfico.

Declaro, sin embargo, que en casos como éste la aplicación rigurosa del Art. 73 resulta más legalística que justa, y además inconveniente porque afecta sin necesidad imperiosa la grafía de un nombre muy conocido, a la que el mundo botánico habíase acostumbrado desde hace mucho tiempo, y que en final de cuentas es correcta desde el punto de vista genuinamente ortográfico. Esta consideración final es de suma importancia, a mi modo de ver.

Sería altamente conveniente adoptar para el Código de Nomenclatura una regla que en ciertos casos permita estabilizar oficialmente la grafía de algunos nombres de género bien conocidos, consagrando la costumbre o manera inveterada de escribirlos, sobre todo si ella es correcta ortográficamente, y teniendo en cuenta el método actual para la formación de los nombres de género (ver Art. 73, Recomendación 73-B, párrafo (a) para el caso de Albizzia vs. Albizia).

La Albizia guachapele hállase distribuída por las regiones cálidas neotropicales desde Chiapas, en México (Matuda 4021, Miranda 6008) y la América Central hasta la parte norteña de Suramérica (Colombia, Venezuela, occidente del Ecuador) y se encuentra desde el nivel del mar hasta unos 1400 a 1500 metros (en el occidente de Cundinamarca, Colombia, valle del rio Chocho, abajo de Fusagasugá, Dugand 3531, COL, US). Los nombres vulgares que se anotan en Colombia son los siguientes: "tabaca" y "sana-

guaro" en el Atlántico y norte de Bolívar; "masaguaro" en Arauca; "iguá" en el Huila y Tolima; "iguá amarillo" en el Tolima y Cundinamarca; "samán iguá" en Fusagasugá, Cundinamarca. La madera se conoce en el comercio de Barranquilla con el nombre de "higo amarillo", corruptela idiomática de "iguá amarillo".

CHLOROLEUCON MANGENSE (Jacq.) Britton & Rose, N. Am. Fl. 23: 38. 1928.

Mimosa mangensis Jacquin, Enum. 34. 1760; Sel. Stirp. 267. 1763 (Isla de Manga, Cartagena, Colombia).

Inga marthae Spreng. ex DC. Prodr. 2: 441. 1825

Pithecolobium mangense (Jacq.) Macbride, Contr. Gray Herb. 59: 3. 1919; - Woodson et Shery, Ann. Mo. Bot. Gard. 37: 241. 1950.

Albizzia marthae Britton & Killip, Ann. N.Y. Acad. Sci. 35: 133. 1936 (Colombia, Magdalena: Santa Marta, H.H. Smith 296, Tipo en US).

A la lista de sinónimos ya enumerados por Britton y Killip (op. cit.) y por Woodson y Schery (op. cit.) es necesario añadir la Albizzia marthae Britton & Killip, pues el Tipo respectivo en nada difiere de los ejemplares florecidos y de hojas tiernas de Chloroleucon mangense (por ejemplo, Dugand 4620 y 5004, Elias 186, Haught 4117 y H.H. Smith 2064, todos del norte de Colombia). Inclusive es idéntico al Tipo de Inga marthae Spreng. ex DC.(Bertero s.n., Santa Marta, Colombia), cuya fotografía he visto. Es de notar que a pesar de ser iguales los epítetos respectivos, Albizzia marthae Br. & Killip no es transferencia nomenclatural de Inga marthae Spreng. ex DC.

COLOMBIA. - Magdalena: Bertero s/n., 1822 (foto 6971 Herb. Delessert); Santa Marta, H.H. Smith 2064 y 2065 (US); Dry forest near Fonseca, 175 m., April 1944, Haught 4117 (US) Atlántico: Vicinity of Barranquilla, Mayo 1927, Elias 186 (US); - Manatí, Dugand 400-B (US); entre Palmar de Varela y Ponedera, Dugand 4182, 4438, 4620 (US); Malambo, Dugand 5004 (US); carretera a Puerto Colombia, kilómetros 5 a 6, Dugand 6569, 6793 y 6938 (US). Bolívar: north of Arjona, Nov. 1926, Killip & A.C. Smith 14494 (US); Cerro de la Popa, Cartagena, Barkley & Araque Molina 19 Bo-044 (US).

ECUADOR: El Oro, 6 kilometros south of Arenillas, June 1943, Little 6697 (US) "charán blanco"; Vicinity of Portovelo, Oct. 1918, Britton & Rose 23452 (US). Estos ejemplares ecuatorianos tienen las hojas (raquis, raquilas y folíolos en el envés) algo más pubescentes que los de Colombia, que a veces son pubérulos, aunque generalmente glabros.

PANAMA. - Numerosos ejemplares de Chloroleucon mangense he examinado en el herbario US, idénticos a los de Colombia. En su Flora of Panama, Woodson y Schery sólo citan uno de aquel país (Veraguas: Santiago, Allen 1082).

El nombre vulgar más usual para este árbol es "vainillo" en el norte de Colombia (Deptos. del Atlántico, Magdalena y norte de Bolívar). También lo llaman "hoyo de zorra" en algunos lugares del Atlántico.

Con respecto a la localidad-tipo indicada por Jacquin ("Habitat Carthagenae, frequens in insula Mango") conviene explicar que dicha isla llámase en realidad Manga. Hállase en la bahía interior de Cartagena, y un angosto canal la separa de la tierra firme, a la cual está unida por varios puentes. Hoy totalmente urbanizada constituye un importante barrio residencial de la ciudad de Cartagena.

ENTEROLOBIUM CYCLOCARPUM (Jacq.) Grisebach, Fl. Brit. W. Ind. 226. 1860.

Mimosa cyclocarpa Jacquin, Fragm. Bot. 30. 1801.

Albizzia (?) longipes Britton & Killip. Ann. N.Y. Acad. Sci. 35: 132. 1936 (Sabanalarga, vicinity of Barranquilla, Atlántico, Colombia, Elias 499, Tipo en US).

El exámen del Tipo de Albizzia longipes me ha convencido de que no se trata de nada distinto a la conocidísima especie cuyo nombre encabeza este artículo y que es tan común an las regiones cálidas neotropicales desde el sur de México hasta el norte de Suramérica.

Nombres vulgares:"carito" y "orejero" en la costa colombiana del Caribe y el Bajo Magdalena.

SENEGALIA ELIASIANA Britton & Killip, Ann. N.Y. Acad. Aci. 35: 145. 1936 (Colombia. - Atlántico: Baranoa, Elias 602, Tipo en US).

Acacia Eliasana (Br. & Kill.) Standley, Trop. Woods 52: 27. 1937.

En la clave que Britton y Killip (op. cit. pp. 141-142) dan para las especies de Senegalia en Colombia, clave que por cierto adolece de algunas deficiencias, colocan a S. affinis y S. eliasiana una al lado de la otra (Nos. 11 y 12) distinguiéndolas por el ancho de los folíolos ("about 1 1/2 mm." en affinis; "about 2 1/2 mm." en eliasiana) y por el caracter de la pubescencia en el envés de los mismos ("loosely pilose" en affinis; "appressed-pubescent" en eliasiana).

He examinado el tipo de eliasiana (herb. US) y un fragmento escasísimo del de affinis en el mismo herbario, comparándolos con el abundante material que he coleccionado en la localidad-tipo de eliasiana. Me parece que se trata probablemente de una misma especie. En efecto, la pubescencia de los folíolos varía en los ejemplares míos topotípicos de eliasiana; y por el ancho de los mismos algunos de ellos son iguales al tipo de affinis. Además observo que la única legumbre presente en el fragmento de dicho tipo tiene la misma pubescencia menuda que las del tipo de eliasiana; mas este caracter es también variable por cuanto entre los ejemplares míos de esta especie hay algunos de legumbre típicamente pubérula y otros que la tienen totalmente glabra.

Falta obtener mejores ejemplares de la supuesta especie affinis en la región al sur de Santa Marta, preferiblemente por los lados de la Zona Bananera pues fue en Guamachito donde el recordado Profesor Samuel J. Record coleccionó el tipo respectivo. Solo entonces podrá definirse si es sinónima de S. eliasiana.

COLOMBIA. - Atlántico: Baranoa, Nov. 1928, Elias 602 (Tipo de S. eliasiana, US); - Baranoa, en la carretera a Usiacurí, 130 m., Oct. 1936, Dugand 1055 (US); misma región, 100 m., Sept. 1937, Dugand 1122 (US); - Alrededores de Galapa y Baranoa, Jul. 1943, Dugand & Jaramillo 3441 (COL, US); - Entre Baranoa y Galapa, 80-100 m., Dic. 1960, Dugand 5400 (US); misma localidad, 100 m., Abril 1961, Dugand 5646 y 5650 (US); misma loc. 120-140 m., Sept. 1961, Dugand 5780 (US); Dic. 1962, Dugand 5940, 5961, 5963 (US); Ene. 1962, Dugand 6048 y 6053 (US); cerca de Ponedera, Sept. 1963, Dugand 6456 (US).

Además, en mi herbario particular: Atlántico: Entre Baranoa y Galapa, 80-100 m., Dic. 1960, Dugand 5401, 5402, 5403.

Muy frecuente en la región central del Departamento del Atlántico, donde se le llama generalmente "zarza blanca", a veces "baranó", éste es un arbusto ramoso de 3 a 4 m. de altura, que llega a ser arbol pequeño, de unos 6 a 7 metros. Sus ramas son angulosas, de corteza blancuzca o por lo menos de color claro, armadas con espinas retrocurvas negruzcas; son dichas ramas muy alargadas (alcanzan a veces hasta 6 o 7 metros de longitud), tendidas o arqueadas hacia abajo, y recuéstanse a menudo sobre otros arbustos y arboles pequeños afirmándose a ellos inextricablemente con sus garfios.

Para complementar la descripción original un tanto deficiente de Senegalia eliasiana diré que el pecíolo presenta una o dos glándulas, y además hay otras glándulas más o menos conspícuas sobre la ráquis, en la intersección de las 2 a 4 últimas raquilas distales. La ráquis puede ser inerme, aunque lo más frecuente es que presente por el envés espinas retrocurvas, pequeñas y poco numerosas. El número de pinnas foliares puede ser tan sólo de 5 a 7 (Dugand 5646, 5940) o de 12 a 14 (Dugand 3441, 5780, 6053); los folíolos son de 15 a 40 en cada lado de la raquila, y su tamaño varia desde 4 mm. por 1 mm. (Dugand 5400, 5940, 5961, 5963, 6048) hasta 10 mm. por 2 3/4 mm. (Dugand 5646). La legumbre madura, ya al punto de dehiscencia, suele alcanzar a veces de 15 a 18 cm. por 2.2 a 2.4 cm. (Dugand 5403, 5963, 6048, 6053) y puede ser, como ya lo dije antes, más o menos pubérula o totalmente glabra.

THEOPHRASTACEAE

JACQUINIA L., Diss. Fl. Jam. App. 27. 1759 (Jaquinia); Amoen. Acad. 5: 388. 1760 (Jaquinia); Sp. Pl. ed. 2: 271. 1762(Jaquinia).

Jacquinia Jacquin, Enum. Pl. Carib. 2 et 15. 1760; Sel. Stirp. Amer. Hist. 53. 1763; Linn. Gen. Pl. ed. 6: 101. 1764; Syst. Nat. ed. 12: 175. 1767.

Como ya lo senaló E. L. Little (Amer. Midl. Nat. 33: 510. 1945) la grafía original de este nombre es Jaquinia. Asi aparece, en efecto, en una de las disertaciones de las Amenidades Académicas de Linneo, vol. 5, que lleva por título "Flora Jamaicensis, quam, praeside D.D. Car. Linneo, proposuit Carolus Gust. Sand-

mark, Vermelandus", publicada en Upsala el 13 de diciembre de 1759. La última página de dicha disertación. o sea la p. 388 del volúmen quinto de las Amoenitates, contiene un Appendix en el cual aparece la descripción original de Jaquinia. No menciona especie alguna y sólo hace referencia a la plancha 123 del Hortus Elthamensis de Dillenius (1732), que representa la J. ruscifolia de Jacquin. Por lo tanto ésta es tipo del género.

Comenzando por Jacquin (Enum. Pl. Carib. 15. 1760) ha sido costumbre general de los botánicos el atribuir el género Jacquinia a Linneo y no a Sandmark, aunque éste es aparentemente el autor de la mencionada Flora Jamaicensis. La razón ha sido explicada por William Thomas Stearn en la parte introductoria de la reimpresión facsimil del Species Plantarum de Linneo, ed. I (1753), publicada en 1957 por la Ray Society de Londres, Cap. VII, pp. 51-55. Señala el Dr. Stearn que los nombres botánicos publicados en las disertaciones, ya en opúsculos separados, ya reunidas bajo el título de Amoenitates Academicae, deben ser atribuídos únicamente a los presidentes de tesis (en el caso de Jacquinia fue Linneo) y no a los estudiantes o graduandos que aparecen como autores de ellas. En efecto - sigue explicando el Dr. Stearn - conforme a las costumbres académicas de carácter medieval que en aquel tiempo regían en las universidades de Suecia, los profesores o el tutor docente de los graduandos no sólo preparaban tales tesis, ora por completo, ora en sus partes más importantes, sino que se les consideraba primariamente o del todo responsables de lo que en ellas se trataba, siempre que actuaran como presidentes en el debate público que se acostumbraba celebrar en las universidades para presentarlas. La actuación del graduando se limitaba a pagar de su peculio la impresión de la tesis y defenderla verbalmente en latín como respondente en el debate. Para mayores detalles consúltese a Stearn. loc. cit.

La pagina titular principal de las Amoenitates Academicae, vol. 5, anuncia que en dicho volúmen están reunidas varias disertaciones sobre Fisica, Medicina y Botánica publicadas separadamente con anterioridad. La Flora Jamaicensis salió a la luz pública el 13 de diciembre de 1759, fecha que figura en su propia página titular, mientras que el mencionado volúmen no fue publicado antes del 4 de agosto de 1760, pues ésta es la fecha que aparece en la página dedicatoria.

Con respecto a la ortografía de este nombre genérico, si se aplica sin reservas el Art. 73 del Código de Nomenclatura debiera escribirse Jaquinia y no Jacquinia, pues la primera es la forma que aparece en la publicación original. Linneo también escribió Jaquinia en la segunda edición de su Species Plantarum (p. 271. 1762); empero - y ésto es de suma importancia - en la edición sexta del Genera Plantarum (1764, p. 101) adoptó la grafía Jacquinia, que de allí en adelante continuó empleando en todas sus obras. Quizás el cambio debióse a influencia de Nicolás J. Jacquin (a quien se conmemora con este género) pues dicho botánico hizo tal corrección ortográfica en su Enumeratio Plantarum... (1760) y su Selectarum Stirpium Americanarum Historia (1763). Desde entonces la grafía Jacquinia ha sido la adoptada

universalmente por los botánicos, con rarísimas excepciones (por ejemplo, los autores de la reciente Flora of Barbados, p. 320, 1965, emplean Jaquinia).

Como ya lo manifesté algunas paginas atrás, en ocasión de comentar el caso de Albizia vs. Albizzia, la aplicación sin reservas del Art. 73 en este caso resulta mas legalística que justa, y además inconveniente por cuanto afecta sin necesidad la grafía de un nombre muy conocido, que el mundo botánico háse acostumbrado a escribir Jacquinia y no Jaquinia. Al contrario del caso Albizia (latinización intencional) en el de Jaquinia trátase, a mi modo de ver, de un simple error ortográfico. Prueba de ello es que Linneo mismo enmendó la grafía adoptando la forma Jacquinia desde 1764 en adelante; lo cual equivale a una enmienda ortográfica de las que permite el Art. 73 en su primer párrafo.

Es deseable y de esperarse que en un próximo Congreso Internacional de Botánica se resuelve modificar el Art. 73 del Código en el sentido de conservar la grafía de aquellos nombres de género que conmemoran a personas, acorde con la ortografía usual del nombre de dichas personas y a pesar de haber sido publicados originalmente en forma diferente, cuando haya sido empleada de manera constante por los botánicos, como ocurre en el caso de Jacquinia. Esto, por supuesto, sin perjuicio de las latinizaciones clasicas ya tan conocidas, y las claramente intencionales de que trata la Nota 5 del referido Art. 73. Aunque algunas excepciones lógicas desde el punto de vista ortográfico (como en el caso de Albizzia) podrían establecerse para conveniencia de todos los botánicos y mayor estabilidad de la nomenclatura.

Por lo pronto, fundándome en que la grafía original Jaquinia no obedece a una latinización intencional sino a un error ortográfico, continúo empleando la forma tradicional Jacquinia establecida por Jacquin (1760 y 1763) y aceptada por Linneo (1764 en adelante).

JACQUINIA ARISTATA Jacquin, Fragm. Bot. 64, t. 95, f. 2. 1809 (Venezuela: Caracas).

Jacquinia caracasana Kunth in H. & B. Nov. Gen. & Sp. 3: 251. 1818 (Venezuela: litoral árido entre La Guayra y Cabo Blanco, Humb. & Bonpl., Tipo en herb. Mus. Paris; foto en US).

Jacquinia aristata Jacq., Mez in Engl. Pflanzenreich 4, 236-A: 40. 1903.

Jacquinia geniculata Mez, loc. cit. 38 ("Venezuela"sphalm. = Colombia: an der Mündung des Rio Magdalena bei Sabanilla; - Karsten, Herb. Wien).

Jacquinia gracilis Mez, loc. cit. 39 (Colombia: "in der Sierra de Sta. Marta" (?) - Funck No. 334, Herb. Deless.; foto del tipo en US).

Jacquinia ovalifolia Mez, loc. cit. 41 (Venezuela: La Guayra; - Karsten, Herb. Wien).

Jacquinia aciculata Mez in Urban Sumb. Antill. 2: 450. 1901 (locus classicus certus haud manifestus; cum magna autem

probabilitate in litore colombiensi maris Caribaei situs).

Jacquinia aurantiaca auct. plur.

Que yo sepa, hasta ahora no se había aclarado - inexplicablemente por cierto - cual es la pátria clásica de la Jacquinia aristata. El Index de Kew da esta planta como oriunda de las "Indias occidentales," es decir, las Antillas. Mez, en su monografía del género dice que la patria de orígen se desconoce. Sin embargo, en la primera línea del protólogo Jacquin manifiesta claramente que fue traída de Caracas ! Conviene aclarar de una vez que esta indicación de localidad no significa tanto la ciudad como la antigua provincia de Caracas, que en aquel tiempo (antes de la independencia de Venezuela) comprendía por lo menos los Estados actuales de Aragua y Miranda adema's del Distrito Federal, cuya cabecera es la ciudad de Caracas.

La descripción de Jacquin, además de la excelente ilustración en colores naturales (plancha No. 95) que la acompaña, no ofrece duda acerca de que la Jacquinia aristata es la misma especie que más tarde fue llamada J. caracasana por Kunth. El tipo de esta ultima fue coleccionado por Humboldt y Bonpland en el litoral árido de Venezuela, entre el puerto de La Guayra y el Cabo Blanco, es decir, en la angosta faja costera del Distrito Federal. Y precisamente de la misma localidad (La Guayra) es la J. ovalifolia Mez, que sólo difiere por la figura de las hojas.

La forma y tamaño de las hojas de J. aristata Jacq. suele variar un tanto, a veces en una misma localidad, entre más o menos angostamente lanceoladas u oblanceoladas (que son las más frecuentes) y más o menos obovadas con la base cuneada. La razón o proporción aritmética más frecuente entre la longitud y el ancho de la lámina foliar (sin contar la púa apical) hállase entre 3x1 y 4x1. Menos frecuentes son las de lámina muy angosta (alrededor de 5x1) y mucho menos las de lámina ancha (2x1). Raras son las del tipo de ovalifolia (menos de 2x1) pues entre todos los ejemplares examinados sólo caben aquí Rose 21857, de Puerto Cabello, así como algunas hojas seleccionadas entre las de Pittier 12425 y Curran & Haman 935, coleccionados muy cerca de la localidad-tipo de J. ovalifolia; y una buena parte de las de Haught 3991 de Fonseca, en la Guajira colombiana.

Dos ejemplares de hojas muy pequeñas (menos de 25 mm. x 5 mm.), tal vez muy jóvenes, son del Estado Lara, en Venezuala (Saer 66 y Ginés 4400, US), pero sus flores son idénticas a las de todos los demás de ese país y de Colombia, inclusive Elias 1163, de Puerto Colombia, que es el de hojas mayores que he visto (hasta 80 mm. x 25 mm.).

En J. aristata la inflorescencia es fundamentalmente racimosa, pero a veces tiene aspecto de corimbo cuando los pedicelos de la parte proximal son más largos que los siguientes, y éstos más que los subsiguientes en orden ascendente en el ráquis. Los estambres son siempre más cortos que los estaminodios, unas veces muy notablemente, otras veces menos, pero nunca llegan a igualarlos en longitud. Y el estilo es siempre evidente, corto o relativamente alargado, pese a que Mez lo vio muy breve en aciculata

y casi nulo en caracasana.

La flor antes de abrirse tiene los pétalos verdoso-amarillentos; al desplegarse la corola y el conjunto de estaminodios petaloideos son de color generalmente amarillo; pronto cambian a amarillo anranjado (entre Cadmium Yellow y Yellow-Orange de la escala de Ridgway 1912) o también a naranjado vivo (entre Orange Chrome y Grenadine Red de la misma escala), a menudo con fuerte tendencia a escarlata (Scarlet, de Ridgway). En algunos árboles las flores conservan durante toda la antesis el color amarillo original, a veces más o menos anaranjado, pero sin llegar a naranjado vivo ni a escarlata. De las fragancias naturales más agradables que conozco destácase el suave olor de las flores de Jacquinia aristata.

Con relación a la J. geniculata Mez, no he visto el Tipo, ni foto de él, pero he observado numerosos ejemplares silvestres (y coleccionado algunos) en la propia localidad-tipo visitada por Karsten (Sabanilla, cerca de la boca del rio Magdalena, en Colombia, que Mez situa erróneamente en Venezuela). Son iguales a los del litoral de Venezuela que adscribo a J. aristata Jacq. El carácter de "notablemente geniculado" que Mez atribuye a la ráquis de la inflorescencia de su J. geniculata no es nada común sino rarisímo en los ejemplares de la región de Sabanilla, Salgar, Puerto Colombia, Barranquilla, etc., o sea la parte septentrional del Departamento del Atlántico; sólo lo he observado en unos pocos de los muchos que ahí he visto; pero aun tales ejemplares poseen no sólo flores en todo idénticas a las de los demás, sino también hojas iguales, dentro del márgen de variación de figura y tamaño que senalé antes. Por lo tanto, la geniculación del ráquis de la inflorescencia es carácter cuando más puramente individual.

Por lo que atañe a la J. gracilis Mez, el ejemplar representado en la fotografía del Tipo (Funck 334, herb. Delessert) es, para todo objeto práctico, igual a los demás de J. aristata. La patria clásica de esta gracilis se no conoce de modo preciso porque el rótulo dice "S. Marta" y luego inmediatamente abajo "Caracas". Otro rótulo adherido a la cartulina en 1901 dice "Caracas (Amérique Méridionale)". Sabemos que entre los muchos lugares visitados por Nicolás Funck en Venezuela y Colombia figuran Caracas y Santa Marta, mas esto no aclara la localidad exacta del Tipo de J. gracilis. Mez, en su monografía, dice que esta planta es de la "Sierra de Santa Marta", lo cual no puede ser cierto porque las Jacquinias no se encuentran en dichas montañas sino en las colinas áridas al pie de ellas, o en las llanuras subxerofíticas circundantes; en todo caso en el piso megatérmico. Un hecho muy significativo para determinar en que país coleccionó Funck el referido ejemplar es que el segundo rótulo adherido a la cartulina del Tipo dice que el ejemplar fue recibido en Enero de 1844: Sabemos que Funk herborizó en el norte del Depto. del Magdalena (Santa Marta, Valledupar y el flanco meridional de la Sierra Nevada) en el segundo semestre de 1843 y embarcóse hacia Hamburgo a fines del mismo año. Es probable que llevara consigo los ejemplares de sus colecciones de fines de

1843, que entregó en Europa en enero de 1844. Esto refuerza mi tesis de que el Tipo de gracilis procede de Colombia y no de Caracas.

Ahora bien, si Funck coleccionó su ejemplar en la región de Santa Marta, como se puede inferir de la indicación de Mez, es probable que haya sido en los alrededores próximos a la ciudad, donde este arbolito es muy frecuente, especialmente en los bosques y fruticetos áridos del litoral. Pero también lo he visto en los bosques xerófilos de las llanuras cercanas a Valledupar, que Funck atravesó para subir después al flanco meridional de la Sierra Nevada.

No es posible apreciar en la foto del Tipo de J. gracilis el caracter de las anteras que, según Mez, tienen el conectivo prolongado en acumen más allá de los lóculos o tecas, diferenciándose así - siempre según Mez - del grupo en que dicho autor coloca a J. aristata, ovalifolia, aciculata, caracasana y aurantiaca, las cuales no tienen "acuminado" el conectivo, o lo tienen escasamente. Cuestión, pues, mas cuantitativa que cualitativa. El ápice del conectivo en los numerosos ejemplares (vivos y de herbario) de J. aristata que he examinado es casi siempre agudo y prolóngase un poco más allá de las tecas; pero en muchas flores de edad algo avanzada aparece más o menos tronchado, como mordido, quizás por insectos.

Con respecto a la J. aciculata Mez, la fotografía del Tipo (von Rohr ex herb. Vahl, Herb. Copenhagen) no muestra diferencia alguna, en lo que atañe a las hojas e inflorescencias, con los ejemplares de Colombia y Venezuela que aquí adscribo a J. aristata Jacq. La patria clásica de esta aciculata es también dudosa: el rótulo nada dice, y sólo sabemos que Julius von Rohr coleccionó plantas para Martín Vahl en el año de 1786 en Jamaica, Puerto Rico y varias de las Antillas menores, así como en las islas subcontinentales de Trinidad y Curazao junto a la costa de la América del Sur; y en este continente en Surinam, Cayena, Santa Marta y Cartagena. Por lo tanto, vista la similitud del Tipo de J. aciculata Mez con los ejemplares de J. aristata Jacq. del litoral norteño de Colombia, es probable que von Rohr coleccionó su planta en los alrededores de cualquiera de los dos puertos marítimos colombianos subrayados arriba. En ambas localidades se encuentra la J. aristata, aunque más abundante y fácil de encontrar la he observado en las cercanías de Santa Marta. Es muy signicativo que Mez, en su monografía, cita el ejemplar Bertero 2648 como J. aciculata. Este fue coleccionado seguramente por Carlo Giuseppe Bertero en el litoral norteño de Colombia, quizás en Santa Marta pues él visitó esa ciudad en diciembre de 1820. Me anima a sostener esta tesis el hecho de que un número cercano de su colección, el 2612 (Serjania curassavica, citado por Radlkofer en Pflanzenr. 98a, IV. 165, bd. 1: 203. 1933), es de Barranquilla, en cuyos alrededores coleccionó Bertero en octubre de 1820. Allí se encuentra también la J. aristata Jacq.

Jacquinia aurantiaca auct. - Algunos ejemplares de Colombia y Venezuela, de los que examiné con motivo de este estudio en el

herbario US, llevan rótulo de J. aurantiaca Aiton. Gran número de los de México y la América Central están igualmente rotulados. Observo que entre los centro-americanos, algunos de Nicaragua y Costa Rica pueden tal vez identificarse con la J. aristata Jacq. del litoral colombo-venezolano; pero el tiempo me faltó para estudiarlos a espacio.

Es de notar que el epíteto aurantiaca de William Aiton data del año de 1811 (Hort. Kew. ed. 2, vol. 2, p. 6) y por lo tanto quedaría substituido por el de aristata Jacq. (1809) en el caso de probarse que son sinónimos. En cuanto a la patria nativa de J. aurantiaca se dió originalmente como "islas Sandwich" (=Hawaii), lo cual es sin duda erróneo.

Jacquinia aristata Jacq. es por lo general un arbusto o arbúsculo de 2 a 3 m. de altura, a veces árbol pequeño de 4 a 6 m. y raras veces 8 m.; el tronco, de corteza oscura, puede llegar a 40 cms. de diámetro en los árboles viejos, pero por lo general no excede de unos 20 cms.; y cuando es arbusto los tallos principales tienen cuando más unos 10 cms. de grosor. La copa es muy ramosa; las ramas rígidas. Es característico de los lugares áridos, particularmente los espinares, cardonales y bosques bajos de la región litoral, pero también se encuentra con frecuencia en los bosquecillos aislados ("matas de monte") que salpican las sabanas subxerofíticas al sur de las montañas de Santa Marta, en las llanuras del Rio Cesare.

Nombres vulgares. - En la costa de Colombia: "barbasco", "barbasco de púa", "sarnícalo", "sarniclo", "sarnisclo". En Venezuela: "trompito" y "trompillo".

VENEZUELA. - Anzoátegui: valley of Puerto La Cruz, Pittier 9204 (US). Aragua: Ocumare de la Costa, Ll. Williams 12185 (US). Carabobo: Puerto Cabello, Rose 21857 (US). Distrito Federal: Cabo Blanco, Curran & Haman 935 (US); Pittier 12425 y 14411 (US); between Caracas and La Guayra, Rose 21721 (US). Falcón: Paraguaná, Adícora, Tamayo 928 (US). Lara: Bobare, 600 m., Jahn 185 (US); Barquisimeto, Saer 66 (US); between Rio Tocuyo and Carora, Pittier 12611 (US); Carora, Ginés 4400 (US); sin loc. Delgado 95 (US). Sucre: Cumanacoa, Netting 22 (US). Zulia: Isla de San Carlos, Curran & Haman 786 (US). Estado ?: sin loc. Curran & Haman 421, 455, 470 (US).

COLOMBIA. - Atlántico: Barranquilla, Elias 945 y 975 (US); Puerto Colombia, Elias 1051, 1162, 1163 (US); Sabanilla, Dugand 5213 (COL, US); llanada de Juanmina, Dugand 6584; entre Puerto Colombia y Salgar, Dugand 3220 (COL, US); entre Las Flores y La Playa, Cuatrecasas 24298 (US); entre Barranquilla y Galapa, Dugand 135 (Y); Santo Tomás, Paul B-8 (US); entre Palmar de Varela y Ponedera, Dugand 352 (Y), 4603 (COL, US). Bolívar: vicinity of Cartagena, Heriberto 279 (US). Guajira: Riohacha, Sinclair s.n. (US); Cuatrecasas 25453 y 25460 (US); Fonseca, Haught 3991 (US). Magdalena: Santa Marta, H.H. Smith 413 (US); Dawe 487 (US);

Curran 384 (GH, US); Killip & A.C. Smith 21101 (GH, US); Araque-Molina & Barkley 18-Mag 090 (US); playa de Concha, cerca de Santa Marta, Dugand 5894 (US); Donjaca, east of Santa Marta, Record 54 (A, GH); valle del Rio Cesare, Los Venados, Dugand 5586 (US); St. Marthe à Cerro San Antonio, col. ? (GH).

Agradezco vivamente al estimado colega Leandro Aristeguieta, Encargado del Instituto Botánico de Venezuela, en Caracas, la ayuda muy valiosa que me prestó examinando los ejemplares de su herbario rotulados J. caracasana, J. aciculata y J. geniculata, sobre los cuales me informó en interesante carta. Todos pueden adscribirse a Jacquinia aristata Jacq.

Notas sobre la flora de Colombia y paises vecinos.

English Summary

First of a series of short papers concerning mainly little known, new or otherwise interesting elements of the flora of the Caribbean coastal plain and the lower Magdalena valley in northern Colombia. In several instances species from other sections of Colombia and neighboring areas in Venezuela and Panama, as well as other countries in South and Central America and the Antillean islands are mentioned.

This initial paper deals with CACTACEAE (Acanthocereus sicariguensis Cr. & Tam.; Acanthocereus tetragonus (L.) Hummlk. and its new var. micracanthus Dugand; Pilosocereus lanuginosus (L.) Byl. & Rowl.; Pilosocereus colombianus (Br. & Rose) Byl. & Rowl.); EUPHORBIACEAE (Chamaesyce mesembryanthemifolia (Jacq.) Dug.; Croton fragilis Kunth; Croton guildingii Griseb.; Margaritaria nobilis L.f. and its variety hypomalaca (Standl.) Dugand); LEGUMINOSAE-MIMOSOIDEAE (Albizia guachapele (Kunth) Dugand; Chloroleucon mangense (Jacq.) Br. & Rose; Enterolobium cyclocarpum (Jacq.) Griseb.; Senegalia ellasiana Br. & Killip), and THEOPHRASTACEAE (a discussion of the correct spelling of Jacquinia vs. Jaquinia, and an evaluation of the little known J. aristata Jacq. 1809, of which several synonyms are cited).

A. Dugand

ADDITIONAL MATERIALS TOWARD A MONOGRAPH OF THE GENUS CALLICARPA. I

Harold N. Moldenke

This is the thirtieth in my series of works of monographic nature on the genera of Verbenaceae, Avicenniaceae, Stilbaceae, Chloanthaceae, and Symphoremaceae. Previous genera so treated by me are Acantholippia Griseb., Aegiphila Jacq., Amasonia L. f., Avicennia L., Baillonia Bocq., Bouchea Cham., Casselia Nees & Mart., Castelia Cav., Chascanum E. Mey., Citharexylum B. Juss., Cornutia Plum., Diostea Miers, Dipyrena Hook., Hierobotana Briq., Lippia Houst., Parodianthus Troncoso, Petitia Jacq., Petrea Houst., Priva Adans., Pseudocarpidium Millsp., Recordia Moldenke, Rehdera Moldenke, Rhaphithamnus Miers, Stylodon Raf., Svensonia Moldenke, Tectona L. f., Verbena [Dorst.] L., and Vitex Tourn. The New World and cultivated members of the genus Callicarpa were also treated by me in this fashion in Fedde, Repert. Spec. Nov. 39: 288—317 and 40: 38—131 (1936). In order to conserve space, material recorded in this previous work is not repeated here except where it needs addition or emendation.

The list of abbreviations employed by me in the citation of specimens, as given in Phytologia 5: 154—159 (1955) and added to in later monographs, is repeated herewith for convenience because of the numerous necessary additions and emendations over the past eleven years. My reasons for employing these short abbreviations, rather than the often very much longer ones recommended by the international committee, are stated in the 1955 work and in previous publications. As of this writing, I have examined and formally annotated 194,873 herbarium specimens from 284 institutional and private herbaria.

A = Arnold Arboretum Herbarium, Harvard University, Cambridge, Massachusetts
Aa = H. Ahles Herbarium, University of North Carolina, Chapel Hill, North Carolina
Ac = Botanisk Institut, Aarhus Universitet, Aarhus, Denmark
Ad = Universidad de los Andes, Mérida, Venezuela
Af = National Herbarium, Pretoria, Transvaal, South Africa
Ag = Carlos Muños Herbarium, Ministerio de Agricultura, Santiago, Chile
Ah = J. C. Arthur Herbarium, Purdue University, Lafayette, Indiana
Ak = Alan Hancock Foundation, University of Southern California, Los Angeles, California
Al = New York State Museum, Albany, New York
Am = Southwest Research Station, American Museum of Natural History, Portal, Arizona
An = Institut Français d'Afrique Noire, Dakar, Senegal
Ar = United States National Arboretum, Washington, D. C.
As = C. F. Asenjo Herbarium, University of Wisconsin, Madison, Wis-

consin
Au = University of Texas, Austin, Texas
Av = Facultad de Agronomía y Veterinaria, Universidad de Buenos Aires, Buenos Aires, Argentina
B = Botanisches Museum und Garten, Berlin-Dahlem, Germany
Ba = Bailey Hortorium, Cornell University, Ithaca, New York
Bb = Barbados Museum and Historical Society, Bridgetown, Barbados
Bc = Barnard College Herbarium, New York Botanical Garden, New York City
Bd = Herbarium Bradeanum, Rio de Janeiro, Brazil
Be = Instituto Agronomico de Norte, Belém, Brazil
Bf = Instituto de Botánica y Farmacologia, Buenos Aires, Argentina
Bg = Bergens Museum, Bergen, Norway
Bh = Instituto Agronomico do Servico Publica de Estado, Belo Horizonte, Brazil
Bi = Bernice P. Bishop Museum, Honolulu, Hawaii
Bj = B. J. Bayer Herbarium, Jamaica, New York
Bk = Royal Forestry Department, Bangkok, Thailand
Bl = University of Colorado, Boulder, Colorado
Bm = British Museum of Natural History, London, England
Bn = Central College, Bangalore, Mysore, India
Bo = Instituto de la Salle, Bogotá, Colombia
Br = Jardin Botanique de l'Etat, Brussels, Belgium
Bs = Basler Botanische Gesellschaft, Basel, Switzerland
Bt = Butler University, Indianapolis, Indiana
Bu = W. M. Buswell Herbarium, University of Miami, Coral Gables, Florida
Bv = Bureau of Plant Industry Station, Beltsville, Maryland
By = Brooklyn College, Brooklyn, New York City
Bz = Herbarium Bogoriense, Buitenzorg, Java, Indonesia
C = Columbia University Herbarium, New York Botanical Garden, New York City
Ca = University of California, Berkeley, California
Cb = Delessert Herbarium, Conservatoire et Jardin Botaniques, Geneva, Switzerland
Cc = Colorado College, Colorado Springs, Colorado
Cd = Museo de Córdoba, Córdoba, Argentina
Ch = Carey Herbarium, Royal Botanic Gardens, Kew, England
Ci = Escuela Superior Agricultura Tropical, Cali, Colombia
Cl = Royal Botanic Gardens, Calcutta, India
Cm = Carnegie Museum, Pittsburgh, Pennsylvania
Cn = University of Cincinnati, Cincinnati, Ohio
Co = North Appalachian Experimental Watershed, Coshocton, Ohio
Cp = Universitetets Botaniske Museum, Copenhagen, Denmark
Cr = J. Carabia Herbarium, Sansalito, California
Cs = Department of Biology, Agricultural and Mechanical College of Texas, College Station, Texas
Ct = Bolus Herbarium, University of Capetown, Capetown, South Africa
Cu = Cambridge University, Cambridge, England
Cz = Canal Zone Biological Area, Barro Colorado Island, Canal Zone

D = Academy of Natural Sciences, Philadelphia, Pennsylvania
Da = United States Department of Agriculture, Washington, D. C.
Dc = De Candolle Herbarium, Conservatoire et Jardin Botaniques, Geneva, Switzerland
Dd = Botanic Gardens, Dehra Dun, Uttar Pradesh, India
De = Delzie Demaree Herbarium, Monticello, Arkansas
Dg = Otto Degener Herbarium, Waialua, Hawaii
Di = Carthage College, Carthage, Illinois
Dm = C. C. Deam Herbarium, Bluffton, Indiana
Dp = De Pauw University, Greencastle, Indiana
Dr = Botanisches Institut, Dresden, Germany
Dt = Jesup Herbarium, Dartmouth College, Hanover, New Hampshire
Du = Dudley Herbarium, Stanford University, Stanford, California
Dv = Botany Department, College of Agriculture, Davis, California
E = Missouri Botanical Garden, Saint Louis, Missouri
Ea = Earlham College, Earlham, Indiana
Ec = Universidad Nacional de Loja, Loja, Ecuador
Ed = Royal Botanic Garden, Edinburgh, Scotland
El = José Eugenio Leite Herbarium, Novo Friburgo, Rio de Janeiro, Brazil
En = J. Ewan Herbarium, New Orleans, Louisiana
Er = Palynologiska Laboratoriet, Bromma, Sweden
Es = Estacion Experimental Agronomica, Santiago de las Vegas, Havana, Cuba
Ew = Erik Wall Herbarium, Stockholm, Sweden
F = Chicago Natural History Museum, Chicago, Illinois
Fc = Colorado Agricultural and Mechanical College, Fort Collins, Colorado
Fg = Arizona State College, Flagstaff, Arizona
Fj = Fred B. Jones Herbarium, Corpus Christi, Texas
Fl = University of Florida, Gainesville, Florida
Fn = Facultad Nacional de Agronomia, Universidad Nacional, Medellin, Colombia
Fo = Instituto Botanico della Universita, Florence, Italy
Fs = Forrest Shreve Herbarium, University of Arizona, Tucson, Arizona
Fx = Lauretta E. Fox Herbarium, Natchitoches, Louisiana
Fy = University of Arkansas, Fayetteville, Arkansas
G = Gray Herbarium, Harvard University, Cambridge, Massachusetts
Ga = Georgia Agricultural Experiment Station, Experiment, Georgia
Ge = H. S. Gentry Herbarium, Tucson, Arizona
Gg = California Academy of Sciences, San Francisco, California
Gl = Museu Goeldi, Belém, Pará, Brazil
Gm = Wallich Herbarium, Royal Botanic Gardens, Kew, England
Go = Botaniska Trädgard, Göteborg, Sweden
Gp = Ontario Agricultural College, Guelph, Ontario, Canada
Gt = Botanische Anstalten, Göttingen, Germany
Gu = University of Georgia, Athens, Georgia
H = Duke University, Durham, North Carolina
Ha = Colegio de la Salle, Vedado, Havana, Cuba
Hb = H. Bassler Herbarium, New York Botanical Garden, New York City

He = W. G. Herter Herbarium, Montevideo, Uruguay
Hi = University of North Carolina, Chapel Hill, North Carolina
Hk = University of Helsinki, Helsinki, Finland
Hn = Herbario Nacional Colombiano, Instituto Ciencias Naturales, Bogotá, Colombia
Hp = H. Hapeman Herbarium, Minden, Nebraska
Hq = Instituto Botanico Dr. Julio Henriques, Coimbra, Portugal
Hr = H. Hürlimann Herbarium, CIBA, Basel, Switzerland
Hs = Crispus Attucks High School, Indianapolis, Indiana
Hu = Sam Houston State Teachers College, Huntsville, Texas
Hv = Academia de Ciencias, Havana, Cuba
Hw = Howard University, Washington, D. C.
I = Langlois Herbarium, Catholic University of America, Washington, D. C.
Ib = Instituto de Botanica e Agricola del I. N. T. A., Buenos Aires, Argentina
Id = University of Idaho, Southern Branch, Pocatello, Idaho
Ih = Instituto de Historia Natural, Curitiba, Paraná, Brazil
Ij = Science Museum, Institue of Jamaica, Kingston, Jamaica
Il = Illinois State Museum, Springfield, Illinois
In = Indiana University, Bloomington, Indiana
Io = Iowa State College, Ames, Iowa
Ip = Escuela Nacional de Ciencias Biologicas, Instituto Politecnico Nacional, Mexico City, Mexico
It = Cornell University, Ithaca, New York
J = Brooklyn Botanic Garden, Brooklyn, New York City
Ja = Museu Nacional, Rio de Janeiro, Guanabara, Brazil
Jc = J. Cuatrecasas Herbarium, Bensenville, Illinois
Je = William Jewell College, Liberty, Missouri
Jn = Aage Bohus-Jensen Herbarium, Lyngbye, Denmark
Jr = Hebrew University, Jerusalem, Israel
Jz = J. de J. Jiminéz Herbarium, Santiago de los Caballeros, Dominican Republic
K = Royal Botanic Gardens, Kew, England
Ka = Kansas State College, Manhattan, Kansas
Ke = Kern Herbarium, Pennsylvania State College, State College, Pennsylvania
Kg = Department of Agriculture, Kagoshima University, Kagoshima, Japan
Ki = E. P. Killip Herbarium, University of Rochester, Rochester, New York
Ko = Botanisches Institut, Universität Köln, Köln, Germany
Kr = B. A. Krukoff Herbarium, Smithtown, New York
Ku = Eberhard Kausel Herbarium, Santiago, Chile
Ky = University of Kentucky, Lexington, Kentucky
L = Jardin Botanique Principal, Leningrad, U. S. S. R.
La = University of California at L. A., Los Angeles, California
Lb = University of Missouri, Columbia, Missouri
Ld = C. L. Lundell Herbarium, Renner, Texas
Le = Rijksherbarium, Leiden, Netherlands
Lg = Fritz Lemperg Herbarium, Hatzendorf, Steiermark, Austria
Lh = Laboratory Herbarium, Department of Botany, Barnard College,

New York City
Li = Colegio Salesiano, Lima, Peru
Ll = Lloyd Library, Cincinnati, Ohio
Lm = Los Angeles County Museum, Los Angeles, California
Lo = Gaulterio Looser Herbarium, Santiago, Chile
Ls = Linnean Herbarium, Linnean Society, London, England
Lu = Botanisk Museum, University of Lund, Lund, Sweden
Lw = University of Kansas, Lawrence, Kansas
Lz = A. Lutz Herbarium, Universidade do Brasil, Rio de Janeiro, Guanabara, Brazil
M = Meisner Herbarium, New York Botanical Garden, New York City
Ma = Forest Department of Malaya, Kepong, Selangor, Malaya
Mb = Melbourne Botanic Garden, Melbourne, Victoria, Australia
Mc = J. B. McFarlin Herbarium, Sebring, Florida
Md = University of Maryland, College Park, Maryland
Me = Instituto de Biologia, Universidad Nacional de México, Mexico City, Mexico
Mf = Maharan's College, Bangalore, India
Mg = Montreal Botanical Garden, Montreal, Quebec, Canada
Mh = Matuda Herbarium, Mexico City, Mexico
Mi = University of Michigan, Ann Arbor, Michigan
Mk = F. C. MacKeever Herbarium, Mount Vernon, New York
Ml = Instituto Miguel Lillo, Tucumán, Argentina
Mm = McGill University, Montreal, Quebec, Canada
Mn = University of Montana, Missoula, Montana
Mo = Morris Arboretum, Philadelphia, Pennsylvania
Mp = Museo Paranaënse, Curitiba, Paraná, Brazil
Mr = Morehead State College, Morehead, Kentucky
Ms = University of Massachusetts, Amherst, Massachusetts
Mt = Mary Thais Herbarium, St. Mary's High School, Perth Amboy, New Jersey
Mu = Botanisches Museum, Munich, Germany
Mv = Marie-Victorin Herbarium, Montreal Botanical Garden, Montreal, Quebec, Canada
N = Britton Herbarium, New York Botanical Garden, New York City
Na = Natal Government Herbarium, Durban, Natal, South Africa
Nb = Stephen F. Austin State College, Nacogdoches, Texas
Nc = State Normal College, Natchitoches, Louisiana
Nd = Notre Dame University, Notre Dame, Indiana
Ng = Department of Forests, Lae, New Guinea
Nj = Douglas College, New Brunswick, New Jersey
Nm = Newark Museum, Newark, New Jersey
No = North Carolina State College, Raleigh, North Carolina
Nt = North Texas State Teachers College, Denton, Texas
O = University of Tennessee, Knoxville, Tennessee
Oa = Oakes Ames Economic Herbarium, Botanical Museum, Harvard University, Cambridge, Massachusetts
Ob = Oberlin College, Oberlin, Ohio
Og = Percy Olrog Herbarium, Stockholm, Sweden
Ok = University of Oklahoma, Norman, Oklahoma
Ol = Universitetets Botaniske Museum, Oslo, Norway
Om = Omer E. Sperry Herbarium, Alpine, Texas

Or = Oregon State College, Corvallis, Oregon
Os = Osborn Botanical Laboratory, Yale University, New Haven, Connecticut
Ot = National Herbarium of Canada, Ottawa, Ontario, Canada
Ox = Oxford University, Oxford, England
P = Muséum National d'Histoire Naturelle, Paris, France
Pa = College of Pharmacy Herbarium, New York Botanical Garden, New York City
Pb = R. Probst Herbarium, Langendorf, Switzerland
Pc = Philip Cheitman Herbarium, New York City
Pe = Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru
Pf = Centro de Pesquisas Florestais e Conservacão de Natureza, Tijuca, Rio de Janeiro, Brazil
Ph = Philippine Bureau of Science, Manila, Philippine Islands
Pi = Polytechnic Institute of Puerto Rico, San Germán, Puerto Rico
Pl = State College of Washington, Pullman, Washington
Pm = Pharma Herbarium, CIBA, Basel, Switzerland
Pn = Parque Nacional de Serra dos Orgãos, Terezopolis, Rio de Janeiro, Brazil
Po = Pomona College, Claremont, California
Pr = Princeton University Herbarium, New York Botanical Garden, New York City
Pu = Purdue University, Lafayette, Indiana
Q = Jardin Botanico, Madrid, Spain
Qi = W. C. Werner Herbarium, Painesville, Ohio
Qu = North Queensland Herbarium, North Queensland Naturalists Club, Cairns, Queensland, Australia
R = Trinidad & Tobago Botanical Garden, Port-of-Spain, Trinidad
Ra = Museo Nacional de Historia Natural, Buenos Aires, Argentina
Rb = Colegio Anchieta, Porto Alegre, Santa Catarina, Brazil
Rd = Herbario Barbosa Rodrigues, Itajai, Santa Catarina, Brazil
Re = R. E. Schultes Herbarium, Cambridge, Massachusetts
Rf = Texas Research Foundation, Renner, Texas
Rg = J. T. Roig Herbarium, Estacion Experimental Agronomica, Santiago de las Vegas, Havana, Cuba
Rh = Government Herbarium, Causeway, Salisbury, Rhodesia
Rl = Herbario Ruiz Leal, Godoy Cruz, Mendoza, Argentina
Ro = Santa Rosa Junior College, Santa Rosa, California
Rr = Robert Runyon Herbarium, Brownsville, Texas
Rs = Rancho Santa Ana Botanic Garden, Claremont, California
Ru = Rutgers University, New Brunswick, New Jersey
S = Naturhistoriska Riksmuseum, Stockholm, Sweden
Sa = Henry R. Carter Memorial Laboratory, Savannah, Georgia
Sc = Colegio Notra Señora de la Caridad, Santiago, Cuba
Sd = San Diego Society of Natural History, San Diego, California
Se = University of Washington, Seattle, Washington
Sf = Servico Florestal do Estado, São Paulo, Brazil
Sg = Museo Nacional de Historia Natural, Santiago, Chile
Sh = Blythe Sherwood Herbarium, Pawling, New York
Si = Instituto Darwinion, San Isidro, Argentina
Sj = University of Puerto Rico, San Juan, Puerto Rico

Sk = University of Saskatchewan, Saskatoon, Saskatchewan, Canada
Sm = Southern Methodist University, Dallas, Texas
Sp = Jardim Botanico, São Paulo, Brazil
Sq = E. R. Squibb and Sons, New York City
Sr = Sul Ross Teachers College, Alpine, Texas
Ss = Science Service, Department of Agriculture, Ottawa, Ontario, Canada
St = Oklahoma State University, Stillwater, Oklahoma
Sw = J. Otis Swift Herbarium, New York City
Sz = A. G. Schulz Herbarium, Colonia Benítez, Chaco, Argentina
T = Torrey Herbarium, New York Botanical Garden, New York City
Tc = Torrey Botanical Club Herbarium, New York Botanical Garden, New York City
Th = Thunberg Herbarium, Botaniska Institutionen, Uppsala, Sweden
Tj = University of Santo Domingo, Santo Domingo, Dominican Republic
Tl = Tulane University, New Orleans, Louisiana
Tm = Transvaal Museum, Pretoria, Transvaal, South Africa
To = United States Field Station, Sacaton, Arizona
Tr = S. M. Tracy Herbarium, Texas Agricultural Experiment Station, College Station, Texas
Tu = University of Arizona, Tucson, Arizona
U = Jenman Herbarium, Botanic Garden, Georgetown, British Guiana
Ua = Utah State Agricultural College, Logan, Utah
Ug = Museo de Historia Natural, Montevideo, Uruguay
Ul = Centro de Botanica, Junta de Investigações do Ultramar, Lisbon, Portugal
Um = University of Montreal, Montreal, Quebec, Canada
Up = University of Pennsylvania, Philadelphia, Pennsylvania
Ur = University of Illinois, Urbana, Illinois
Us = Botaniska Institutiones, Uppsala, Sweden
Ut = Botanisch Museum en Herbarium, Utrecht, Netherlands
V = Naturhistorisches Museum, Vienna, Austria
Va = Vanderbilt University, Nashville, Tennessee
Ve = Museo Comercial de Venezuela, Caracas, Venezuela
Vi = Marie-Victorin Herbarium, University of Montreal, Montreal, Quebec, Canada
Vl = Facultad de Agronomia del Valle, Valle del Cauca, Colombia
Vt = University of Vermont, Burlington, Vermont
Vu = Botanisches Institut der Universität, Vienna, Austria
Vx = Växtbiologiska Institutionen, Uppsala Universitets, Uppsala, Sweden
W = United States National Museum, Smithsonian Institution, Washington, D. C.
Wb = Wilson Brown Herbarium, Jesuit Tertianship, Auriesville, New York
We = West Virginia University, Morgantown, West Virginia
Wh = Faculdade de Farmacia e Odontologia, Universidad de São Paulo, São Paulo, Brazil
Wi = Witte Memorial Museum, San Antonio, Texas
Wl = William Lucian Herbarium, Waterbury, Connecticut
Wp = University of Manitoba, Winnipeg, Manitoba, Canada

Ws = University of Wisconsin, Madison, Wisconsin
Ww = Rob and Bessie Welder Wildlife Foundation, Corpus Christi, Texas
Wx = Max Gordon Herbarium, New York City
X = Herbier Boissier, Conservatoire et Jardin Botaniques, Geneva, Switzerland
Xa = Blatter Herbarium, Saint Xavier's College, Bombay, India
Y = Yale School of Forestry, New Haven, Connecticut
Yu = T. G. Yuncker Herbarium, Greencastle, Indiana
Z = H. N. Moldenke Herbarium, Plainfield, New Jersey

CALLICARPA L., Act. Soc. Reg. Sci. Ups. 80 (1741); Sp. Pl., ed. 1, 1: 111 (1753); Gen. Pl., ed. 5, 50. 1754.

Additional & emended synonymy: Tomex L., Nov. Pl. Gen. Diss. Dassow 5. 1747. Illa Herm. ex L., Nov. Pl. Gen. Diss. Dassow 5. 1747. Spondylococcos Mitch., Act. Phys.-med. Acad. Caes. Leopold.-Carol. Nat. Cur. 8 (app.): 218. 1748. Johnsonia T. Dale ex P. Mill., Gard. Dict., ed. 6, app. 75 (1752), ed. 7. 1759. Sphondylococcos Mitch. apud L., Sp. Pl., ed. 1, 1: 111, in syn. 1753. Burcardia Heist. ex Duham., Trait. Arb. & Arbust. 1: 111—112, pl. 44. 1755. Spondylococcus Mitch. apud P. Mill., Gard. Dict., ed. 7, in syn. 1759. Burchardia Duham. apud L., Sp. Pl., ed. 2, 1: 161, in syn. 1762 [not Burchardia R. Br., 1810]. Johnsonia Mill. apud L., Sp. Pl., ed. 2, 1: 161, in syn. 1762. Tomox L. apud Adans., Fam. Pl. 2: 446, in syn. 1763. Illa Adans., Fam. Pl. 2: 446. 1763. Spondylococus Mitch. apud P. Mill., Gard. Dict., ed. 8, in syn. 1768. Callacarpa P. Mill., Gard. Dict., ed. 8, in syn. 1768. Burchardia Heist. apud Reichard, Linn. Gen. Pl., ed. 8, 56, in syn. 1778. Burcardia Duham. apud Lam., Encycl. Méth. Bot. 1: 563, in syn. 1783. Porphyra Lour., Fl. Cochinch., ed. 1, 1: 69. 1790 [not Porphyra C. Agardh, 1822]. Spondylococcus Mitch. apud Reichenb. in Mössler, Handb. Gewächsk., ed. 1, 1: xxxvi. 1827. Amictonis Raf., Sylv. Tellur. 161. 1838. Sphondylococcum Mitch. apud Endl., Gen. Pl. 637, in syn. 1838. Johnsonia Catesby apud Endl., Gen. Pl. 637, in syn. 1838. Callicarpus L. apud Hassk., Cat. Pl. Hort. Bot. Bogor. 136. 1844. Sphondylococcus Mitch. apud Walp., Repert. 4: 127, in syn. 1845. Callicarpus Hassk. apud Miq., Fl. Ind. Bat. 2: 884, in syn. 1857. Spondylococca Mitch. apud Benth. in Benth. & Hook. f., Gen. Pl. 2 (2): 1150, in syn. 1876. Calycarpa L. apud Featherman, Rep. Bot. Surv. South Cent. La. 99. 1891. Burchardia (Heist.) Duham. ex Jacks. in Hook. f. & Jacks., Ind. Kew, 1: 386, in syn. 1893. Tomea L. apud Jacks. in Hook. f. & Jacks., Ind. Kew. 1: 386, in syn. 1893. Callicapra Rama Rao, Flower. Pl. Travancore 314, sphalm. 1914. Burcardia (Heist.) Duham. ex Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 9, in syn. 1921. Burcardia Mill. ex Moldenke in Fedde, Repert. Spec. Nov.

39: 291, in syn. 1936. Spondylococcum Mitch. ex Moldenke in Fedde, Repert. Spec. Nov. 39: 291, in syn. 1936. Calicarpa L. ex Moldenke in Fedde, Repert. Spec. Nov. 39: 291, in syn. 1936. Calicocarpa L. ex Moldenke in Fedde, Repert. Spec. Nov. 39: 291, in syn. 1936. Callicarpha L. ex Moldenke in Fedde, Repert. Spec. Nov. 39: 291, in syn. 1936. Callocarpa L. ex Moldenke in Fedde, Repert. Spec. Nov. 39: 291, in syn. 1936. Callycarpa L. ex Moldenke in Fedde, Repert. Spec. Nov. 39: 291, in syn. 1936. Catlicarpa Schau. apud Moldenke in Fedde, Repert. Spec. Nov. 42: 242, sphalm. 1937. Caliocarpa L. ex Moldenke, Prelim. Alph. List Invalid Names 9, in syn. 1940. Callicarpia L. ex Moldenke, Prelim. Alph. List Invalid Names 13, in syn. 1940. Porphyria Lour. ex Moldenke, Prelim. Alph. List Invalid Names 37, in syn. 1940. Spondylococca L. ex Moldenke, Prelim. Alph. List Invalid Names 40, in syn. 1940. Calicarpus L. ex Moldenke, Suppl. List Invalid Names 1, in syn. 1941. Calleocarpa L. ex Moldenke, Suppl. List Invalid Names 1, in syn. 1941.

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12: 509 (1966), and 13: 328, 329, 332, & 344. 1966; Moldenke, Résumé Suppl. 13: 5 & 6. 1966; Anon., Biol. Abstr. 47 (5): S.23 & S.143. 1966; G. Grimm, N. Y. Herald Trib., sect. 2, 20, February 6. 1966; G. Taylor, Ind. Kew. Suppl. 13: 21. 1966; Balakrishman, Biolog. Abstr. 47: 4615. 1966; J. A. Clark, Card Ind. Gen. Sp. Pl. n.d.

This is a genus of about 188 species and subspecific taxa and hybrids, widely distributed in subtropical and tropical Asia and Oceanica, to a lesser extent in the Americas, a few species extending into the temperate portions of Asia and North America, south to Australia and west to the Seychelles and Madagascar; many are cultivated for their handsome fruit. The type species is C. americana L. The generic name is derived from the Greek words, κάλλος, beauty, and καρπός, fruit -- the first letter of the first Greek word is given erroneously as "X" in my earlier work on this genus through a printer's typographic error which I was not permitted to correct.

Bentham & Mueller (1870) refer to "a few African and American species", but I know of no species of this genus native to continental Africa. They say that "The genus is most readily distinguished from Premna by the inflorescence, and by the flowers more regular with isomerous stamens. The differences in the fruit may not be constant."

It is of interest to note how authors in the past have differed in their estimates of the size of this genus. Bentham (1876) recognized 30 species, a figure repeated by Hemsley (1881--1882) and by King & Gamble (1908). Briquet (1895) and Schneider (1911) modified this estimate to "über 30". Britton (1918) gives the number as "about 35". Nakai (1923), Wisler (1942--1943), and Li (1963) say "about 40 species". Britton & Borwn (1913) increase it to "about 45", while P'ei (1932) makes it "about 80 species". In my 1942 work I give the number as "about 150 species and varieties". Santamour (1965) says that the genus "contains between 40 and 142 species, depending on the authority consulted".

Although Loureiro proposed the name Porphyra in 1790 and Agardh did not propose his algal genus of the same name until 1822, the latter has unfortunately been conserved and is valid for the algal genus under the present edition of the International Rules of Botanic Nomenclature!

Referring to Hasskarl's "correction" of the spelling of the name Callicarpa to "Callicarpus", it is pointed out by Sprague (1950) that under these same present rules the name must remain feminine as originally proposed by Linnaeus.

It should be noted here that Illa Herm., included in the generic synonymy above, being a mononomial, is actually also a part of the synonymy of the species Callicarpa tomentosa (L.) Murr. The Burchardia of Robert Brown, referred to above, is a genus in the Liliaceae.

Geunsia Blume is included in the synonymy of Callicarpa by Schauer (1847), Miquel (1857), Lemaire & Verschaffelt (1859), and

Bakhuizen van den Brink (1921), but I agree with Dr. Lam in regarding it as a distinct and valid genus, differing in having its gynoecium usually 5- (rarely 4-) carpellary, its stamens usually 5 in number, and its leaves usually anisophyllous. Aganon Raf. is included in the synonymy of Callicarpa by Jackson (1893) and by Bakhuizen van den Brink (1921), as well as by myself in my 1936 work on the genus, but, according to Merrill's monumental commentary on Loureiro's plants (1935), is actually not verbenaceous.

Nakai (1923) includes Anonymos baccifera verticillata, folia molli et incano, ex America etc. Pluk. in the generic synonymy of Callicarpa, but this pre-linnean polynomial can certainly not by any stretch of the imagination be regarded as a generic name. It belongs rightfully in the synonymy only of Callicarpa americana L.

The genus Callicarpa is placed in the family Labiatae, Section Verbeneae, by Reichenbach (1827, 1828, 1833), with "Spondylococcus Mitch. non W." as a synonym. This same author regarded Porphyra Lour. as a valid and distinct genus. Dahlgren (1938) also places Callicarpa in the Labiatae.

An additional German common name for the genus as a whole, not recorded by me in my previous work, is "Schönbeere", while in English the members of the group are called "beautyberry", "beautyberries", or "beauty-berries". DeLaszlo & Henshaw (1954) quote H. A. Marshall (1922) regarding a species of this genus called "argerarger" in the Torres Straits, whose young leaves, well chewed by a woman until her body its saturated with the swallowed juice, will cause permanent sterility. Jones (1795) records the vernacular name "máshandarí".

The gynoecium morphology of the genus is discussed by Junell (1934). Roxburgh (1820) refers to the fruit as a 4-seeded "berry", with the "Embryo erect, and furnished with a perisperm". Actually, the fruit is a drupe. Razi (1950) affirms that the seed dissemination is endozoic. Rehder (1927) describes the group as "Ornamental shrubs chiefly grown for the attractive fls. and handsome frs. late in autumn; rather tender, but even if killed back, the young shoots usually flower and fruit the same season."

In the Linnean Herbarium there are three specimens preserved under genus 136, Callicarpa. The first of these is labeled "1. americana" in Linnaeus' own handwriting, plus a label of Gronovius and the notation "vera". The second specimen is labeled "2. tomentosa", with the added notation "cana ?" by J. E. Smith [according to B. D. Jackson]. The specimen is neither C. tomentosa (L.) Murr. nor C. candicans (Burm. f.) Hochr. [formerly known as C. cana L.], but is typical C. nudiflora Hook. & Arn. The third specimen is unidentified, labeled merely "3" and "Ind. or.", and is plainly C. candicans.

Cain (1944) reminds us that Callicarpa is one of the considerable number of genera listed by Asa Gray as being represented in Japan and vicinity [eastern Asia] and in eastern North America, but not in Europe or western North America.

Westcott (1950) records the fungi Meliola cookeana (black mildew) from this genus in Florida and Louisiana and Cercospora callicarpae (leaf-spot) from South Carolina to Texas. It is most probable that she refers here to C. americana L. as the host. Arthur & Cummins (1936) record the fungus Uredo callicarpae Petch from an unidentified species of Callicarpa represented by Clemens 5029.

An unidentified species of this genus from the Philippines is illustrated by Ettingshausen (1861). The Frutex ceramicus of Rumphius (1743), plate 60, is an as yet unidentified species of Callicarpa. Merrill (1917) says "This was described from material originating in Ceram and Banda and is undoubtedly a species of Callicarpa. Hasskarl, Neue Schlüssel (1866) 84, suggested that it might be Grewia inaequalis Blume, but the drawing certainly represents no Grewia, while the description seems to conform to Callicarpa. Field work is necessary in Ceram and Banda before the position of Frutex ceramicus can be definitely settled. Hasskarl .....also suggests that Perlarius alter silvestris may be a species of Callicarpa, but the description is too incomplete to warrant a definite reference of this to any particular genus." I may mention here that, as of the present writing, I know only C. longifolia Lam. from Ceram and C. pedunculata from Banda.

The Matheus 1210, distributed in some herbaria as a Callicarpa, is actually a species of Siparuna in the Monimiaceae; Clemens & Clemens 959 is Buddleia racemosa Torr. in the Loganiaceae. Wissmann 443, in the Vienna herbarium, is determined as Callicarpa on its label, but consists of only two leaves which I do not think are even verbenaceous; similarly, the MacGregor s.n. from East Island in the Louisidades is certainly not verbenaceous; Mocquerys 910 is Aegiphila martinicensis Jacq., while 1018 is A. laeta H.B.K. A sheet from Australia labeled "Burchardia umbellata R. Br." is in the Callicarpa folder in the herbarium of McGill University, but is not verbenaceous -- it represents a valid genus and species in the Liliaceae.

The Uphof (1930) reference in the bibliography above is sometimes erroneously dated "1935--1936" in literature; the Lam & Meeuse (1942) reference is sometimes dated "1945" or "1946" in error; and the Hatusima (1949) reference is sometimes cited "23: 81" in error. Coulter's work on the phanerogams of western Texas (1892) is often misdated "1894", but the section on Gamopetalae was actually issued in 1892. Siebold, Jaarboek van de Koninklijke Nederlandsche Maatschappij tot Aanmoediging van den Tuinbouw 1845: 71, pl. 5 & 6 is often cited in literature as "Ann. Hort. Pays-Bas pl. 5 & 6", an alternate title. The Buchoz (1783) reference is sometimes given as "pl. 43", but the plate in question is plainly labelled "xxxvi" in the New York Botanical Garden library copy. The reference "Journ. Malay. Br. Roy. Asiat. Soc. 2: 615. 1923" is

sometimes cited, but there is no such page number in the stated volume; the same is true of the "Journ. Roy. Asiat. Soc. Bengal 73 (3): 1012 & 1018. 1909".

Specimens from the herbaria of the University of California (Ca), Missouri Botanical Garden (E), Chicago Natural History Museum (F), and the United States National Museum (W), cited in my 1936 work on this genus without herbarium sheet numbers, are repeated in the present work with the proper sheet numbers added.

An alphabetic list of names applying to taxa excluded from the genus Callicarpa:

Callicarpa acuminatissima Teijsm. & Binn. = Geunsia acuminatissima (Teijsm. & Binn) H. J. Lam.
Callicarpa affinis Elm. = Geunsia farinosa Blume
Callicarpa apoënsis Elm. = Geunsia apoënsis (Elm.) Moldenke
Callicarpa cavaleriei Lévl. = Ilex sp., Ilicaceae
Callicarpa cinerea A. Rich. = Petitia domingensis Jacq.
Callicarpa cordifolia Ruíz & Pav. = Aegiphila cordifolia (Ruíz & Pav.) Moldenke
Callicarpa cumingiana Schau. = Geunsia cumingiana (Schau.) Rolfe
Callicarpa dentata Pav. = Cornutia grandifolia (Schlecht. & Cham.) Schau.
Callicarpa dentata Sessé & Moc. = Cornutia grandifolia (Schlecht. & Cham.) Schau.
Callicarpa discolor Willd. = Aegiphila integrifolia (Jacq.) Jacks.
Callicarpa epiphytica Elm. = Geunsia flavida (Elm.) H. J. Lam
Callicarpa esquirolii Lévl. [Esquirol 72] = Dichroa febrifuga Lour., Hydrangeaceae
Callicarpa esquirolii Lévl. [Esquirol 754] = Caryopteris paniculata C. B. Clarke
Callicarpa eucaudata Merr. & Quisumb. = Geunsia cumingiana (Schau.) Rolfe
Callicarpa flavida Elm. = Geunsia flavida (Elm.) H. J. Lam
Callicarpa globiflora Ruíz & Pav. = Aegiphila integrifolia (Jacq.) Jacks.
Callicarpa hexandra Teijsm. & Binn. = Geunsia hexandra (Teijsm. & Binn.) Koord.
Callicarpa hexandria Teijsm. & Binn. = Geunsia hexandra (Teijsm. & Binn.) Koord.
Callicarpa integrifolia Jacq. = Aegiphila integrifolia (Jacq.) Jacks.
Callicarpa lanata Lam. = Premna tomentosa Willd.
Callicarpa leveilleana Fedde = Dichroa febrifuga Lour., Hydrangeaceae
Callicarpa martini Lévl. = Caryopteris paniculata C. B. Clarke
Callicarpa martinii Lévl. = Caryopteris paniculata C. B. Clarke
Callicarpa mekongensis W. W. Sm. = Premna mekongensis W. W. Sm.

Callicarpa paloensis Elm. = Geunsia paloënsis (Elm.) H. J. Lam
Callicarpa paniculata (Kurz) Clarke = Caryopteris paniculata C. B. Clarke
Callicarpa paniculata Lam. = Chilianthus arboreus (L. f.) Benth., Loganiaceae
Callicarpa pentandra Roxb. = Geunsia pentandra (Roxb.) Merr.
Callicarpa pentandra f. farinosa (Blume) Bakh. = Geunsia farinosa Blume
Callicarpa pentandra f. floccosa Bakh. = Geunsia hexandra (Teijsm. & Binn.) Koord.
Callicarpa pentandra f. glabra Bakh. = Geunsia pentandra (Roxb.) Merr.
Callicarpa pentandra f. glabrescens Bakh. = Geunsia pentandra (Roxb.) Merr.
Callicarpa pentandra f. pubescens Bakh. = Geunsia pentandra (Roxb.) Merr.
Callicarpa pentandra var. cumingiana (Schau.) Bakh. = Geunsia cumingiana (Schau.) Rolfe
Callicarpa pentandra var. cumingiana f. dentata Bakh. = Geunsia cumingiana var. dentata (Bakh.) Moldenke
Callicarpa pentandra var. cumingiana f. genuina Bakh. = Geunsia cumingiana (Schau.) Rolfe
Callicarpa pentandra var. cumingiana f. pentamera (H. J. Lam) Bakh. = Geunsia cumingiana (Schau.) Rolfe
Callicarpa pentandra var. cumingiana f. typica Bakh. = Geunsia cumingiana (Schau.) Rolfe
Callicarpa pentandra var. paloensis (Elm.) Bakh. = Geunsia paloënsis (Elm.) H. J. Lam
Callicarpa pentandra var. paloensis f. apoensis Bakh. = Geunsia apoënsis (Elm.) Moldenke
Callicarpa pentandra var. paloensis f. apoensis (Elm.) Bakh. = Geunsia apoënsis (Elm.) Moldenke
Callicarpa pentandra var. paloensis f. celebica (Koord.) Bakh. = Geunsia paloënsis var. celebica (Koord.) Moldenke
Callicarpa pentandra var. paloensis f. furfuracea Bakh. = Geunsia furfuracea (Bakh.) Moldenke
Callicarpa pentandra var. paloensis f. genuina Bakh. = Geunsia paloënsis (Elm.) H. J. Lam
Callicarpa pentandra var. paloensis f. typica Bakh. = Geunsia paloënsis (Elm.) H. J. Lam
Callicarpa pentandra var. pubescens Bakh. = Geunsia cumingiana (Schau.) Rolfe
Callicarpa pentandra var. repleta f. celebica (Koord.) Bakh. = Geunsia paloënsis var. celebica (Koord.) Moldenke
Callicarpa pentandra var. repleta f. furfuracea Bakh. = Geunsia furfuracea (Bakh.) Moldenke

Callicarpa pentandra var. typica (Schau.) Bakh. = Geunsia pentandra (Roxb.) Merr.
Callicarpa pentandra var. typica f. farinosa (Blume) Bakh. = Geunsia farinosa Blume
Callicarpa pentandra var. typica f. flavida (Elm.) Bakh. = Geunsia flavida (Elm.) H. J. Lam
Callicarpa pentandra var. typica f. genuina Bakh. = Geunsia pentandra (Roxb.) Merr.
Callicarpa pentandra var. typica f. hexandra Bakh. = Geunsia hexandra (Teijsm. & Binn.) Koord.
Callicarpa pentandra var. typica f. hexandra (Teijsm. & Binn.) Bakh. = Geunsia hexandra (Teijsm. & Binn.) Koord.
Callicarpa pentandra var. typica f. pubescens Bakh. = Geunsia cumingiana (Schau.) Rolfe
Callicarpa prismatica Robledo = Bouchea prismatica (L.) Kuntze
Callicarpa reticulata Poepp. = Petitia domingensis Jacq.
Callicarpa sorsogonensis Elm. = Geunsia paloënsis (Elm.) H. J. Lam
Callicarpa spinosa Harshberger = Aralia spinosa L., Araliaceae
Callicarpa subglandulosa Elm. = Geunsia pentandra (Roxb.) Merr.
Callicarpa triloba Lour. = Cissus triloba (Lour.) Merr., Vitaceae
Callicarpa umbellata Lour. = ? Premna sp.
Callicarpa vastifolia Diels = Viburnum rhytidophyllum Hemsl., Caprifoliaceae
Callicarpa velutina Presl = Siparuna velutina (Presl) Moldenke, Monimiaceae

CALLICARPA ACULEOLATA Schau. in A. DC., Prodr. 11: 642. 1847.

Emended synonymy: Callicarpa verticillata Hort. ex Moldenke in Fedde, Repert. Spec. Nov. 40: 79, in syn. 1936.

Bibliography: Schau. in A. DC., Prodr. 11: 642. 1847; Griseb., Abhandl. König. Gesell. Wissen. Götting. 7: 256. 1857; Jacks. in Hook. f. & Jacks., Ind. Kew. 1: 386. 1893; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; Urb., Symb. Antil. 7: 356. 1911; Moldenke in Fedde, Repert. Spec. Nov. 39: 299 (1936) and 40: 53, 73, 75, 78—82, 120, & 121. 1936; Moldenke, Geogr. Distrib. Avicenn. 7. 1939; Moldenke, Prelim. Alph. List Invalid Names 13. 1940; Moldenke, Known Geogr. Distrib. Verbenac., ed. 1, 26 & 86. 1942; Moldenke, Alph. List Invalid Names 11. 1942; Moldenke, Alph. List Cit. 1: 39 (1946), 2: 347, 421, & 432 (1948), and 3: 695. 1949; Moldenke, Known Geogr. Distrib. Verbenac., ed. 2, 47 & 176. 1949; Moldenke, Résumé 56, 247, & 443. 1959.

In all, 10 herbarium specimens, including type material of all the names involved, and 7 mounted photographs have been examined by me.

Additional citations: HISPANIOLA: Dominican Republic: Bertero 349 [Macbride photos 33931] (Dc—type, E—119244—isotype, F—969770—photo of type, Kr—photo of type, Mu—941—isotype, N—

photo of type, N--photo of type, Z--photo of type); Lavastre 1718 (N, Z).

CALLICARPA ACUMINATA H.B.K., Nov. Gen. & Sp. Pl. 2: 252. 1818 [not C. acuminata Roxb., 1814, hyponym].

Additional & emended synonymy: Callicarpa subintegerrima H.B.K., Nov. Gen. & Sp. Pl. 2: 252--253. 1818. Callicarpa acuminata Humb. & Bonpl. apud Steud., Nom. Bot., ed. 1, 137. 1821. Callicarpa subintegerrima Humb. & Bonpl. apud Steud., Nom. Bot., ed. 1, 137. 1821. Callicarpa acuminata Humb. apud Spreng. in L., Syst. Veg., ed. 16, 1: 420. 1825. Callicarpa subintegerrima Humb. apud Spreng. in L., Syst. Veg., ed. 16, 1: 420. 1825. Callicarpa bonplandiana Schult., Mant. 3: 50--51. 1827. Callicarpa acuminata Humb. & Kunth apud D. Dietr., Syn. Pl. 1: 428. 1839. Callicarpa mollis Req. ex D. Dietr., Syn. Pl. 1: 428. 1839 [not C. mollis Koord., in herb., nor Matsumura, 1922, nor Shirasawa, 1949, nor Sieb. & Zucc., 1844]. Callicarpa subintegerrima Humb. & Kunth apud D. Dietr., Syn. Pl. 1: 428. 1839. Callicarpa mollis Willd. ex Steud., Nom. Bot., ed. 2, 257, in syn. 1840. Callicarpus acuminata Humb. apud Hassk., Cat. Pl. Hort. Bot. Bogor. Alt. 136. 1844. Callicarpa acuminata Kunth apud Schau. in A. DC., Prodr. 11: 644. 1847. Callicarpa schlimii Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (2): 217--218. 1863. Callicarpa acuminatta H.B.K. apud Goyena, Fl. Nicarag. 2: 566, sphalm. 1911. Callicarpa mimutiflora Rusby, Mem. N. Y. Bot. Gard. 7: 339. 1927. Callicarpa lancifolia Pav. ex Moldenke in Fedde, Repert. Spec. Nov. 40: 38, in syn. 1936 [not C. lancifolia Merr., 1915, nor Millsp., 1906]. Callicarpa subintegerrima Kunth ex Moldenke in Fedde, Repert. Spec. Nov. 40: 38, in syn. 1936. Aegiphila mimutiflora Rusby ex Moldenke, Prelim. Alph. List Invalid Names 3, in syn. 1940. Callicarpa lancifolia Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 11, in syn. 1940. Callicarpa acuminata DC., in herb. Callicarpha acuminata H.B.K., in herb.

Bibliography: Roxb., Hort. Beng. 10. 1814; H.B.K., Nov. Gen. & Sp. Pl. 2: 252--253. 1818; Steud., Nom. Bot., ed. 1, 137. 1821; Kunth, Syn. Pl. 2: 44--45. 1823; Spreng. in L., Syst. Veg., ed. 16, 1: 420. 1825; Schult., Mant. 3: 50--51. 1827; Spreng. in L., Syst. Veg., ed. 16, 5: 126. 1828; Roxb., Fl. Ind., ed. 2 [Carey], 1: 394. 1832; Kostel., Allgem. Mediz.-pharm. Fl. 3: 828. 1834; D. Dietr., Syn. Pl. 1: 428. 1839; Steud., Nom. Bot., ed. 2, 257. 1840; Hassk., Cat. Pl. Hort. Bot. Bogor. 136. 1844; Walp., Repert. 4: 126. 1845; Schau. in A. DC., Prodr. 11: 644. 1847; Rosenth., Syn. Pl. Diaph. 430. 1862; Turcz., Bull. Soc. Imp. Nat. Mosc. 32 (2): 217--218. 1863; Bocq., Adansonia 3: [Rev. Verbenac.] 192. 1863; Griseb., Cat. Pl. Cub. 216. 1866; Sauvalle, Fl. Cub. 112. 1868; W. B. Hemsl., Biol. Cent.-Am. Bot. 2: 538. 1881--1882; Kuntze, Rev. Gen. Pl. 2: 503. 1891; Sessé & Moc., Pl. Nou. Hisp. 2: 18. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew. 1: 386. 1893;

Sessé & Moc., Fl. Mex., ed. 2, 17. 1894; Millsp., Field Columb. Mus. Publ. Bot. 1: 42. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; H. H. Rusby, Mem. Torrey Bot. Club 6: 106. 1896; Briq., Bull. Herb. Boiss. 4: 345. 1896; Just, Bot. Jahresber. 23 (2): 76 & 511. 1897; Goyena, Fl. Nicarag. 2: 566. 1911; Loes., Verh. Bot. Ver. Brand. 53: 81 [Abhandl. 246]. 1912; Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 22. 1921; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1253. 1924; N. L. Britton, Bull. Torrey Bot. Club 53: 463. 1926; H. H. Rusby, Mem. N. Y. Bot. Gard. 7: 339. 1927; P. C. Standl., Field Mus. Publ. Bot. 10: 335. 1931; Moldenke, Bull. Torrey Bot. Club 60: 55. 1932; Moldenke in Fedde, Repert. Spec. Nov. 39: 296, 302, & 307 (1936) and 40: 38—46, 77, 113—115, 118, 120—131, & 166. 1936; C. L. Lundell, Carnegie Inst. Wash. Publ. 478: [Veg. Petén] 47, 75, 109, 111, 113, 138, & 183. 1937; P. C. Standl., Field Mus. Publ. Bot. 18: 999. 1938; Moldenke, Alph. List Common Vern. Names 4, 13, 24—26, 31, & 33. 1939; Moldenke, Geogr. Distrib. Avicenn. 13, 15—17, 19, 23, 28, & 35. 1939; Moldenke, Suppl. List Common Vern. Names 5, 18, & 24. 1940; Moldenke, Prelim. Alph. List Invalid Names 3, 9, & 11—13. 1940; Moldenke, Carnegie Inst. Wash. Publ. 522: 198—200. 1940; Moldenke, Known Geogr. Distrib. Verbenac., ed. 1, 16, 19—23, 30, 31, 34, 40, 71, & 86. 1942; Moldenke, Alph. List Invalid Names 2 & 8—11. 1942; C. L. Lundell, Contrib. Univ. Mich. Herb. 8: 60. 1942; Moldenke, Phytologia 2: 72 & 93. 1945; Moldenke, Alph. List Cit. 1: 4, 7, 9, 29, 37, 41, 50, 58, 92, 98, 100, 104, 123, 133, 135, 148, 178, 194, 209, 210, 227—229, 231, 232, 240, 243, 262, 266, 273, 293, 299, 301, 307, 309, 312, 313, 315, 318, & 320. 1946; Moldenke, Phytologia 2: 334. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 51 & 81. 1948; Moldenke, Alph. List Cit. 2: 329—331, 333—336, 339, 340, 342—344, 349—351, 389, 390, 418, 421, 423, 424, 426—429, 435, 437, 457, 459, 475, 477, 480, 490, 494, 503, 507, 526, 529, 549, 557, 566, 569, 573, 603, 607, 616, 625, 639, 642, & 643 (1948), 3: 656, 659, 664, 676, 677, 679, 696, 709, 714, 730, 740, 755, 757, 758, 768, 779, 785—787, 805, 806, 816—820, 834, 835, 842, 884, 886, 895, 900, 901, 903, 907, 918, 919, 925, 948, 959, 960, 962, 964, 965, 970, 973, & 974 (1949), and 4: 982, 988, 993, 999—1001, 1005, 1006, 1013, 1020, 1022, 1025, 1026, 1028, 1031, 1036, 1038, 1040—1042, 1048, 1052, 1053, 1055, 1057, 1058, 1061, 1065, 1067, 1069, 1070, 1077, 1078, 1082, 1094, 1097, 1131, 1138, 1142, 1151, 1171, 1236, 1239—1241, 1245, & 1291. 1949; Moldenke, Known Geogr. Distrib. Verbenac., ed. 2, 28, 34, 36, 37, 39—41, 58, 59, 62, 71, 96, 156, & 176. 1949; Matuda, Am. Midl. Nat. 44: 575. 1950; Moldenke, Bol. Soc. Venez. Cienc. Nat. 11: 291. 1950; Moldenke, Phytologia 3: 375. 1950; Bravo Hollis & Ramírez Cantú, Anal. Inst. Biol. Mex. 22: 421. 1951; Roig y Mesa, Dicc. Bot. 2: 996. 1953; Moldenke, Phytologia 4: 451. 1953; Moldenke, Résumé 34, 41, 43, 44, 46, 47, 49, 64, 65, 70, 79, 82, 113, 213, 230, 241, 244, 245, 247, & 443. 1959; Moldenke, Résumé Suppl. 5: 5. 1962; J. A. Clark, Card Ind. Gen. Sp. Pl. n.d.

Recent collectors describe this species as a woody shrub, 1—20 feet tall, wide-spreading, scrambling, or even scandent, or a

small, slender, or bushy tree, 4--10 m. tall, the trunk 3/4 to 3 inches in diameter, the bark tan-colored, the wood white, with a large pith, the young growth dusty-pubescent, the leaves membranous, dull-green or rich grass- to pale-green above, paler or grayish beneath, rugose, the inflorescence showy or rather showy, the flowers very small and fragrant, the calyx pale-green, the stamens yellow, and the fruit at first green, then red or reddish-violet, finally dark-purple, blue-black, or black when ripe, in dense clusters. Steyermark refers to the fruit as "berries", but they are drupes. The corolla is described as "whitish" on Martínez-Calderón 195, "creamy-white" on R. McVaugh 10489 and Ll. Williams 9814, "lilac and yellow" on Klug 3879, "violet and yellow" on Klug 4144, and "white" on P. H. Allen 2488 & 5284, Bequaert 26, Breedlove 6488, Cooper 220, Cuatrecasas 9462, Haught 2427 & 4868, R. M. King 3354, Leavenworth 226, Lundell & Lundell 7108, 7519, 7810, & 16402, Steere 1004, Steyermark 56771, and Yuncker 4883. Bequaert 26 is very densely pubescent and may possibly represent C. pringlei Briq.

Common and vernacular names recorded for C. acuminata are "albocar", "aurora", "axin", "blackberry", "Bonpland's Wirbelbeere", "cenicionto", "filigrana de piña", "flor de chichalaque", "fructa de chacha", "patzahumacachil", "pukil", "pukin", "sac pukim", "uva", "uvilla", "vara de alcalde", "vara del alcalde", "x puc yim", and "zacpukim". It should be noted that Roig y Mesa is authority for the name "filigrana de piña" in Cuba, which he refers to Callicarpa acuminata Roxb. It is most probable that he is referring here to C. americana L. or to C. roigii Britton, both of which are found in Pinar del Río, while the true C. acuminata is unknown from the island. The name C. acuminata Roxb. belongs in the synonymy of C. nudiflora Hook. & Arn., an Old World species.

The type of C. subintegerrima was probably collected somewhere in Colombia ["crescit in Regno Novo-Granatensis?", according to Kunth's original description] and is deposited in the Bonpland Herbarium at the Muséum National d'Histœire Naturelle at Paris.

The C. americana Sessé & Moc. included by me in the synonymy of C. acuminata in my 1936 work belongs actually in the synonymy of C. pringlei Briq. instead and the discussion of this name on p. 41 of my work should be so amended. The name, C. lancifolia Merr., mentioned in the synonymy above, is a synonym of C. merrillii Moldenke, but C. lancifolia Millsp. is a valid species. The C. mollis of Koorders is actually C. caudata Maxim., that of Matsamura is C. okinawensis Nakai, that of Shirasawa is xC. shirasawana Mak., while that of Siebold & Zuccarini is a valid species. Hasskarl records (1844) a "Callicarpus acuminata Hmb. Sprg." from Japan, but this is doubtless an error for Callicarpa nudiflora Hook. & Arn. (C. acuminata Roxb.).

Our plant has been found growing in forests or mountain forests, relic forests, light or tropical forests, thickets or open thickets,

old or occupied clearings, acahual, llanos, the alluvial soil in secondary matorral, secondary growth, lowland jungles, second growth on low sandy soil, tall brush, and the fringe of low forests on steep hills, along semidesert roadsides, on slopes and dry hillsides, at the edge of brush, and along village borders, at altitudes of 10 to 1800 meters, flowering from March to December, and fruiting in February, April to September, and November. R. M. King describes it as "locally abundant in open sun" in Alta Verapaz, Guatemala; Woytkowski found it "very abundant in forest" in San Martín, Peru; while McVaugh says "occasional in oak forest on limestone" in San Luis Potosí, and Crutchfield & Johnston found it gowing in "thorn forest on limestone slopes, infrequent along small creek" in Tamaulipas, Mexico. Standley (1931) says of it "occasional in swamps and thickets along the coast; ranging to Panama and Mexico", while later (1938) he says "occasional in thickets of the tierra caliente, Mexico to Bolivia".

One of the specimens of Gouin s.n., cited below, has its fruit modified into pubescent galls. The Tonduz s.n. [Herb. Inst. Physico-geogr. Nat. Costaric. 14882] cited by me on p. 42 of my 1936 work as from "Province undetermined", is actually from Limón, Costa Rica. The Holton 772 from "Las Cañas", Colombia, is said by Dugand to be from Valle del Cauca. The Goudot s.n. from "Coyajena", cited on p. 43 of the 1936 work, is from Coyaima in Tolima, Colombia. One of the Thieme 5507 specimens from Santa Bárbara, Honduras, cited on p. 42 as deposited in the United States National Museum at Washington, is now in the Marie-Victorin Herbarium at the University of Montreal. The Gaumer 1688, cited on p. 42 as from Yucatán, is actually from Quintana Roo, Mexico. E. P. Killip changed the number on Cuatrecasas "9402" in the United States National Herbarium to read "9462" on specific instructions from the collector.

Material of C. acuminata has been misidentified and distributed in herbaria under the names C. pringlei Briq., C. pringleii Briq., C. subpubescens Hook. & Arn., Clibadium sp., Psychotria hebeclada DC., and Viburnum americanum Mill.

The H.B.K. reference given in the bibliography of this species is often cited as "1817", but apparently should actually be "1818". The Rusby (1896) reference is cited as "Rusby, Bolivia Memoirs VI (1896) 106" at the Instituto Miguel Lillo in Tucumán.

In all, 528 herbarium specimens of C. acuminata, including type material of almost all the names involved, and 56 mounted photographs have been examined by me.

Additional & emended citations: MEXICO: Campeche: C. L. Lundell 895 (Ca—486976, Du—222626, E—1017115, F—700524, W—1494524), 1006 (Ca—486898, Du—224768, E—1017030, F—700607, W—1587064). Chiapas: Breedlove 6286 (Ac), 6488 (Z); Gilly & Hernandez Xolocotzi 146 (Mi), 151 (Mi); Matuda 1011 (Mh, Mi, N), 3641 (F—1026375, Mh, Mh, Mi, N). Hidalgo: O. M. Clark 7405 (Ok—18723); Schnooberger 8047 (Mi). Jalisco: Mexia 1108 (Ca—350067, Du—175412, E—960376,

F--689780, Gg--154936, La, W--1317854). Nuevo León: O. M. Clark 6814 (Ok--18717); Graham & Johnston 4640 (Mi). Oaxaca: Martínez-Calderón 195 (Ca--938137, Me, Rf); Nelson 2718 (W--228713); Orcutt 5221 (E--711862); J. V. Santos 2624 (Mi); Ll. Williams 9814 (F--898110, N). Quintana Roo: G. F. Gaumer 1688 (B); Lundell & Lundell 7810 (Mi, N, Rf). San Luis Potosí: M. T. Edwards 455 (Au, Du--278627, F--915215, N), 609 (Du--276821, F--915189); G. L. Fisher 45168 (Du--349953), 45169 (Ew); Hitchcock & Stanford 6946 (W--1806795); Kenoyer 4042 (Mi), A.608 (F--1000786), A.631 (F--1000043), s.n. [Tamazunchale, 8-29-38] (Fs); W. C. Leavenworth 226 (Mi, N, Ur, Ur); LeSueur 425 (F--1003633); Lundell & Lundell 7108 (Mh, Mi, N); R. McVaugh 10489 (Mi); J. Rzedowski 7827 (Ip, Ip). Tamaulipas: Barkley, Webster, & Paxson 864 (N); V. H. Chase 7587 (F--1001717, Fs, Mi, Ur); O. M. Clark 6814 (Fl--228); Crutchfield & Johnston 5799 (Mi); Dressler 1941a (Mi); Hitchcock & Stanford 6868 (Ca--710768, Du--315601, N, Or--54912, Pl--130110, Po--266850, Se--58670, Ur); Kenoyer & Crum 3292 (Mi), 3316 (Mi); Meyer & Rogers 2487 (N); Edw. Palmer 114 (Ca--717602, E--777546, F--436173, W--463050), 174 (Ca--153287, E--118813, F--217514, W--572404), 388 (Ca--145694, E--118816, F--217702, W--572619), 495 (E--778585, F--436429, W--463406); Rutten & Rutten-Pekelharing 494 (Ut); J. Rzedowski 10345 (Mi); Wooton s.n. [Buena Vista] (Mi--photo, W--989734). Veracruz: Ervendberg 212 (D--612060, P); Fournier s.n. [Laguna de Tampico, 1838] (P); Goldman 710 (W--397080); Gouin s.n. [1867] (P, P); Liebmann 11185 (W--1315035), 11186 (W--1315036), 11301 (W--1315084); Edw. Palmer 555 (W--463440); Paray 3159 (Ip); Purpus 4437 (Ca--143278, E--119224, E--119225, F--344052, W--841833), 8870 (Ca--218881, Du--206994, Po--194632); J. V. Santos 2401 (Mi), 2651 (Mi). Yucatán: Bequaert 26 (F--710785, W--1477671), 80 (I--photo); G. F. Gaumer 684a (E--951705), 870 (E--119268, F--36673, Us, W--571806), 1688 (E--852861, F--58486, W--1267404), 24071 (E--948114, F--552075, Po--174965, W--1268166), s.n. [Buena Vista, 1899] (F--187286, Gg--160439, Us, V); Langman 3932 (W--2022085); Linden s.n. [Juillet] (P); Lundell & Lundell 7519 (Du--363000, Ld, Mi, N); Steere 1004 (E--1087224, F--668493, La), 7177 (Me); Steggerda 15b (F--890493). State undetermined: Houstoun s.n. (P); Sessé, Mociño, Castillo, & Maldonado 517 (F--850927, Q). GUATEMALA: Alta Verapaz: R. M. King 3354 (Mi, N); Tejeda 128 (W--862087); Türckheim 8263 (E--119269, Mu--3967, W--398505, W--1323247). Chiquimula: J. A. Steyermark 31737 (F--1034965). El Petén: Aguilar Hidalgo 63 (Du--239585, E--1067855, F--712360); Contreras 2213 (Ld, S), 2705 (Ld, S), 3339 (Ld, S); C. L. Lundell 2088 (F--685323), 2344 (F--693905), 3027 (F--685956), 3635 (Mi), 3755 (F--689472, Gg--248095, Mi, S), 16402

(Ld, S). Izabal: H. Pittier 8622 (W--1013513); P. C. Standley 24399 (W--1150041). Zacapa: C. C. Deam 6300 (E--119218, Ed, F--285137, Vt, W--579609); Record & Kuylen G.130 (W--1315339, Y--10081). BRITISH HONDURAS: Chanek 198 (F--704949); Gentle 25 (F--696464), 199 (Mi, N); C. L. Lundell 4760 (F--683522); Winzerling III.3 (W--1266653). HONDURAS: Atlántida: E. R. Mitchell 70 (F--580597); P. C. Standley 55185 (F--583273, W--1408711). Comayagua: J. P. Edwards P.616 (B, Ca--522750, F--688148, W--1588697). Cortés: Yuncker 4883 (Dp, E--1087012, F--749089). Santa Bárbara: Thieme 5507 (W--355042, W--1323251). BAY ISLANDS: Roatan: G. F. Gaumer 64 (Sg--16054, W--56137). COSTA RICA: Cartago: J. León 1597 [Herb. Inst. Interamer. Turrialba 596] (W--2021476), 1685 [Herb. Inst. Interamer. Turrialba 871] (W--2021491); H. Pittier 3173 (Br, Br); Standley & Valerio 46750 (W--1254834). Limón: Kuntze 1968 (F--297690); Morley 809 (Ca--756765); H. Pittier 4254 (W--1323253), s.n. [Herb. Inst. Physico-geogr. Nat. Costaric. 9741] (Br, Br, W--1323255), s.n. [Herb. Inst. Physico-geogr. Nat. Costaric. 12688] (W--1323252); J. D. Smith 6629 (W--1323249); F. L. Stevens 732 (W--1166552). Puntarenas: P. H. Allen 5284 (N); Brenes 12267 (F--855893), 12339 [218 & 818] (F--856001); Cufodontis 117 (N); Tonduz 6819 (Br, W--1323250); M. Valerio 422 (F--668656). San José: Tonduz 7479 (W--355566, W--1323248), s.n. [Herb. Inst. Physico-geogr. Nat. Costaric. 12788] (W--354272, W--358746). PANAMA: Bocas del Toro: G. P. Cooper 555 (F--579658, W--1521698, Y--12188); H. von Wedel 2666 (N). Canal Zone: Piper 5457 (W--1166031, W--1166032). Coclé: P. H. Allen 2488 (N). Colón: G. P. Cooper 220 (Ca--549869, F--765683, H--38652, N), 220a (F--765684, N), 654 (F--579218, W--1521215, Y--12287). Panamá: H. Pittier 5520 (W--715771). PEARL ISLANDS: San José: C. O. Erlanson 5 (N). COLOMBIA: Antioquia: Brahe, Araque Molina, & Barkley 18C704 (N); Haught 4868 (W--1709525); Toro Toro 1293 (Fn--1666). Cauca: Triana 3712 [1; 186] (Jc). Cundinamarca: Mutis 4707 (Cb, F--712886, W--1561452). Norte de Santander: Schlim 719 (B--photo, Br, S--photo, W--1628268). Tolima: Bonpland 1694 [Macbride photos 39492] (F--1038391--photo of type & isotype, Kr--photo of type & isotype, N--photo of type, N--photo of type & isotype, P--isotype, S--photo of type, Z--photo of type), s.n. [Quindiu] (P); Cuatrecasas 9462 ["9402"] (W--1850801); Hartweg 1315 (Lu); Haught 2427 (N). Valle del Cauca: Cuatrecasas 22883 (F--1341700); F. C. Lehmann 7703 (F--578235, W--938508), K.286 (F--578236). Department undetermined: Bonpland s.n. (E--photo, N--photo, P, P, Z--photo); Linden 1196 (Br). VENEZUELA: Lará: Badillo 472 (Ve). Trujillo: J. A. Steyermark 56771 (N). ECUADOR: Los Ríos: Asplund 5410 (S, W-1930520). PERU: San Martín: Klug 3879 (E--1104815, F--766387, Gg-248620, I, N, S, W--1458287), 4144 (Ca--710140, E--1110840, F--

853163, Gg--247856, I, N, S, W--1458558); Ll. Williams 6817 (N); Woytkowski 5458 [wood voucher 15524] (W--2413474), 7283 (W--2453294). Department undetermined: Herb. Pavon s.n. [Peruvia] (X). BOLIVIA: La Paz: M. Bang 1669 (E--119256, Ed, F--77781, Mu-1730, Pa, Vu, W--56135, W--56136); M. Cárdenas 1768 (W--1232416). CULTIVATED: Austria: Herb. Hort. Schönbrunn s.n. (V); Herb. Hort. Vindob. s.n. [9/1803] (V).

CALLICARPA ACUTIDENS Schau. in A. DC., Prodr. 11: 645. 1847.

Bibliography: Schau. in A. DC., Prodr. 11: 645. 1847; Jacks. in Hook. f. & Jacks., Ind. Kew. 1: 386. 1893; P. Dop, Bull. Soc. Hist. Nat. Toulouse 64: 498—501, 505—506, & 512. 1932; Moldenke, Known Geogr. Distrib. Verbenac., ed. 1, 58 & 86 (1942) and ed. 2, 135 & 176. 1949; Moldenke, Résumé 175 & 443. 1959.

Branchlets densely grayish floccose-tomentose; leaves lanceolate-oblong, about 7.5 cm. long and 4 cm. wide, short-petiolate, narrowly acuminate at the apex, obtuse at the base, unequally dentate along the margins with slender, straight, very acute teeth about 2 mm. long, glabrate and shiny above, pale and glandular-punctate beneath, densely grayish floccose-tomentose on the veins; cymes lax, corymbose, pedunculate, much shorter than the subtending leaves.

The type of this poorly known species was collected by Charles Gaudichaud-Beaupré in Cochinchina and is deposited in the DeCandolle Herbarium at the Conservatoire et Jardin Botaniques at Geneva. Schauer states that a duplicate of the type is deposited in the Kunth herbarium (Berlin), but admits that the species is based on imperfect specimens. He claims that the teeth on the leaf-margins render the species very distinct.

Dop (1932) cites Eberhardt 2621 and Gaudichaud 125 [probably the type] from Annam, Indochina, and comments: "Cette espèce est voisine du C. macrophylla Vahl. En particulier la présence sur les deux faces de la feuille de poils étoilés rapproche nettement les deux espèces. Dans la revision Bakhuizen van der Brink C. acutidens tombe au rang de synonyme de C. cuspidata Roxb. Or celle dernièr espèce est définie par cet auteur comme ayant des poils simples à la face supérieure des feuilles. C'est même ce caractère qui lui permet dans sa clé de séparer C. cuspidata de C. macrophylla. Il y a là une erreur évidente C. acutidens ne peut être réduit au C. cuspidata, mais placé à côte de C. macrophylla, dont la dimension des feuilles et leur découpure marginale la séparent nettement. Il est à remarquer que dans la forme littorale de Tourane, la feuille est un peu plus épaisse et le tomentum plus abondant que dans la forme de Thua Lun; mais dans les deux cas, le caractère du trichome est constant."

The species is known to me only from the literature.

CALLICARPA ACUTIFOLIA Chang, Acta Phytotax. Sin. 1: 284. 1951.

Bibliography: Chang, Acta Phytotax. Sin. 1: 284. 1951; G. Taylor, Ind. Kew. Suppl. 13: 21. 1966.

Nothing is known to me about this taxon except that it is supposed to be native to Kwangtung, China. The original publication has not as yet been available to me for consultation.

CALLICARPA ALBIDO-TOMENTELLA Merr., Philip. Journ. Sci. Bot. 12: 300--301. 1917.

Bibliography: E. D. Merr., Philip. Journ. Sci. Bot. 12: 300--301. 1917; E. D. Merr., Enum. Philip. Pl. 382. 1923; A. W. Hill, Ind. Kew. Suppl. 6: 34. 1926; Moldenke, Known Geogr. Distrib. Verbenac., ed. 1, 61 & 86 (1942) and ed. 2, 140 & 176. 1949; Moldenke, Résumé 182 & 443. 1959.

Shrub, about 2 m. tall; branches terete, grayish, glabrous; branchlets very densely and minutely grayish- or whitish-puberulent with stellate indumentum; leaves decussate-opposite; petioles 4--5 mm. long, densely stellate-puberulent; leaf-blades membranous, lanceolate, 7--11 cm. long, 1.5--2.5 cm. wide, gradually narrowed upwards to the slenderly and sharply acuminate apex, entire, narrowed below to the obtuse base, the base of some leaves slightly inequilateral, the upper surface brownish-olivaceous, glabrous, slightly shiny, the lower surface entirely covered with very dense and minute grayish or whitish puberulence, the indumentum stellate; secondaries 5 or 6 per side, slender, ascending, impressed above; veinlet reticulation loose and very obscure above, entirely obscured by the indumentum beneath; inflorescence axillary, 1.5--2 cm. long, slender, pedunculate, dichotomous, few-flowered, densely stellate-puberulent, the peduncles surpassing the primary branches in length; pedicels slender, 1--1.2 mm. long; prophylla acicular, nearly as long as the pedicels; fruiting-calyx shallow, about 2 mm. wide, densely stellate-puberulent at the base on the outer surface with very short white hair, the rim truncate or very obscurely 4-denticulate; fruit subglobose, purplish when fresh, about 2.5 mm. wide, glabrous.

The type of this little-known species was collected by Maximo Ramos [Herb. Philip. Bur. Sci. 26976] along a small stream in the forest, at an altitude of about 120 meters, on Mount Posuey, in the province of Abra, Luzon, Philippine Islands, on February 5, 1917, and was deposited in the herbarium of the Philippine Bureau of Science at Manila, but is now destroyed. Merrill (1917) states that this is "a most characteristic species, distinguished by its white or grayish-white, very short, dense indumentum, and its entire, lanceolate, membranous leaves which are entirely glabrous on the upper surface. It somewhat resembles C. angusta Schauer, but is not closely allied to that species." Nothing is known to me of this plant except what is given in the literature.

CALLICARPA ALONGENSIS Dop, Bull. Soc. Hist. Nat. Toulouse 64: 509. 1932.

Bibliography: P. Dop, Bull. Soc. Hist. Nat. Toulouse 64: 500, 501, 509, 511, & 512. 1932; A. W. Hill, Ind. Kew. Suppl. 9: 45. 1938; Moldenke, Known Geogr. Distrib. Verbenac., ed. 1, 58 & 86 (1942) and ed. 2, 135 & 176. 1949; Moldenke, Résumé 175 & 443. 1959.

Shrub; branchlets subtetragonal, lightly fulvous-pubescent;

leaves decussate-opposite; petioles 6--10 mm. long; leaf-blades chartaceous, rigid, 10--13 cm. long, 2--3 cm. wide, acute and acuminate-caudate at the apex, denticulate along the margins except at the base, attenuate and acute at the base, stellate-pubescent above when immature, but glabrous and brunneous when mature, lightly short-tomentose beneath with whitish stellate hairs; midrib prominent beneath; secondaries slender, 20--22, ascending, recurved; tertiaries subparallel; veinlet reticulation conspicuous; inflorescence cymose; peduncles 1 cm. long; cymes many-flowered, 2--2.5 cm. long, 1.5--2 cm. wide, dichotomous, fulvous stellate-pubescent; bractlets minute, subulate; flowers very small; calyx conic, 1 mm. long, stellate-tomentose, the rim truncate, very minutely 4-toothed; corolla 2 mm. long, covered on the outside with stellate and simple hairs, the tube broad, the lobes 4, rounded, 0.5 mm. long; stamens 4, long-exserted; filaments inserted at the base of the corolla-tube; anthers scarcely glandulose; style equaling the stamens; stigma infundibular; ovary stellate-pubescent and glandular; drupes black, 1 mm. wide, stellate-pubescent.

The type of this species was collected by O. Debeaux (no. 300) in rock-clefts on Surprise Island, in the Bay of Along, Tonkin, Indochina. Dop (1932) comments that "Cette espèce est voisine du C. acuta Schauer var. typica H. J. Lam des Philippines. Elle s'en distingue nettement par ses feuilles plus petites, munies à la face inférieure d'un tomentum plus fin et non farineux, et par ses fleurs de moitié plus petites. On peut la considérer comme une espèce géographique dérivée du C. acuta." The species to which he refers here is probably C. angusta Schau.

I know nothing of C. alongensis except what is given in the literature quoted above.

CALLICARPA AMERICANA L., Sp. Pl., ed. 1, 1: 111. 1753 [not C. americana Blanco, 1884, nor Hort., 1936, nor Lour., 1794, nor Sessé & Moc., 1893].

Additional & emended synonymy: Anonymos baccifera verticillata, folio molli et incano, ex America Pluk., Almagest. Bot. 33, pl. 136, fig. 3. 1696. Frutex baccifer verticillatus, foliis scabris latis dentatis et conjugatis Catesb., Carol. 2: 47. 1733. Frutex foliis amplis subrotundis acuminatis ex adverso binis, viminibus lentis infirmis, quasi levi canitie tectis Gronov., Fl. Virg. 138. 1739. Johnsonia floribus verticillatus sessilibus T. Dale ex P. Mill., Gard. Dict., ed. 7. 1759. Burchardia callicarpa Crantz, Inst. Rei Herb. 2: 360. 1766. Callicarpa fol. serratis subtus tomentosus L., Mant. 2: 33, 198, & 331. 1767. Johnsonia americana Mill., Gard. Dict., ed. 8. 1768. Frutex baccifer verticillatus, foliis scabris latis dentatis & conjugatis Catesb. apud Houtt., Lin. Pfl. Syst. 3: 101, in syn. 1778. Callicarpa foliis serratis, subtus tomentosis L. apud Houtt., Lin. Pfl. Syst. 3: 101, in syn. 1778. Anonymos baccifera verticillata, folio molli & incano, ex

America Pluk. apud Houtt., Lin. Pfl. Syst. 3: 101, in syn. 1778. Frutex foliis amplis subrotundis acuminatis ex adverso binis, viminibus lentis infirmis quasi leni canitie tectis Gronov. apud Houtt., Lin. Pfl. Syst. 3: 101, in syn. 1778. Callicarpa foliis ovatis acutis serratis, subtus subtomentosis, baccis glomeratis Lam., Encycl. Méth. Bot. 1: 563. 1783. Callicarpa foliis serratis subtus tomentosis L. apud J. A. Murr. in L., Syst. Veg., ed. 14, 153, in syn. 1784. Anonymus &c. Pluk. apud Vitm., Sum. Pl. 1: 307, in syn. 1789. Frutex &c. Catesb. apud Vitm., Sum. Pl. 1: 307, in syn. 1789. Anonymus baccifera, verticillata, folio molli, & incano Pluk. apud Lour., Fl. Cochinch., ed. 1, 1: 70, in syn. 1790. Anonymos baccifera verticillata, folio molli & incano Pluk. apud Gaertn., Fruct. & Sem. Pl. 2: 80, in syn. 1791. Frutex baccifer verticillatus foliis scabris latis dentatis & conjugatis Catesb. apud Gaertn., Fruct. & Sem. Pl. 2: 80, in syn. 1791. Anonymus baccifera, verticillata, folio molli et incano Pluk. apud Lour., Fl. Cochinch., ed. 2, 1: 88, in syn. 1793. Callicarpa serrata Moench, Meth. 468. 1794. Callicarpa viburnifolia Salisb., Prodr. Stirp. Chap. Allert. 53. 1796. Johnsonia (americana) floribus verticillatis sessilibus, foliis ovato-lanceolatis oppositis, caule fruticoso Mill. apud Willd., Linn. Sp. Pl. 1: 619, in syn. 1797. Anonymus baccifera verticillata, folio molli et incano, ex America Pluk. apud Willd., Linn. Sp. Pl. 1: 619, in syn. 1797. Frutex baccifer verticillatus, foliis scabris latis dentatis et coniugatis Catesb. apud Willd., Linn. Sp. Pl. 1: 619, in syn. 1797. Frutex foliis amplis subrotundis acuminatis ex adverso binis, viminibus lentis infirmis quasi leni canitie tectis Gronov. apud Willd., Linn. Sp. Pl. 1: 619, in syn. 1797. Callicarpa americana; foliis ovatis acuminatis inaequaliter obtuse dentatis basi cuneato-attenuatis integerrimis subtus ramulisque leviter tomentosis, calycibus nudiusculis Willd. apud Roem. & Schult., Syst. Veg. 3: 93, in syn. 1818. Callicarpa ramis pruinoso-tomentosis, foliis lato-ovalibus, utrinque acutis, dentatis subtus subtomentosis, cymis sessilibus petiolo brevioribus Michx. apud Roem. & Schult., Syst. Veg. 3: 93, in syn. 1818. Callicarpa americana Willd. ex Roxb., Fl. Ind., ed. 1 [Carey & Wall.], 1: 407, in obs. 1820. Johnsonia americana Moench ex Steud., Nom. Bot., ed. 1, 137, in syn. 1821. Anonymos baccifera etc. Pluk. apud Walp., Repert. 4: 127, in syn. 1845. Frutex baccifer verticillatus etc. Catesb. apud Walp., Repert. 4: 127, in syn. 1845. Callicarpa americana (var.) purpurea F. J. Muller, Am. Gard. 10: 463. 1889. Burchardia americana Duham. apud Jacks. in Hook. f. & Jacks., Ind. Kew. 1: 361, in syn. 1893. Callicarpa amerikana L. ex Moldenke in Fedde, Repert. Spec. Nov. 39: 304, in syn. 1936. Callicarpa villosa Baldw. ex Moldenke in Fedde, Repert. Spec. Nov.

39: 305, in syn. 1936 [not C. villosa Roxb., 1814, nor Vahl, 1794]. Callicarpa americana var. purpurea F. J. Muller apud Moldenke in Fedde, Repert. Spec. Nov. 39: 305, in syn. 1936. Callicarpia americana L. ex Moldenke, Prelim. Alph. List Invalid Names 13, in syn. 1940. Callicarpa virginiana L. ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941. Callicarpus americana L. ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941. Calleocarpa americana L. ex Moldenke, Suppl. List Invalid Names 1, in syn. 1941. Calicarpus americana L. ex Moldenke, Suppl. List Invalid Names 1, in syn. 1941. Callicarpa americana Roxb. ex Roig y Mesa, Plant. Medic. 775, sphalm. 1945. Calicarpa americana L., in herb. Callicarpa americana Lam., in herb.

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TWO NEW SPECIES OF LIPPIA

Harold N. Moldenke

LIPPIA CULMENICOLA Moldenke, sp. nov.

Arbor; foliis inter anthesin parvissimis ca. 1 cm. longis 4 mm. latis ellipticis utrinque pilosulis ad apicem et basin acutis, supra mediam pauciserratis; capitulis numerosis brevissime pedunculatis; pedunculis filiformibus 4—8 mm. longis puberulis; capitulis parvis 5—10 mm. latis, 5 mm. longis; bracteolis purpureis pilosulis.

Tree, to 7 m. tall, practically leafless during anthesis; branches numerous, very twiggy, light-gray, glabrous; twigs numerous, slender, gray, glabrous, somewhat tetragonal and sulcate; nodes not annulate; principal internodes abbreviated, 1—3.5 cm. long; leaves decussate-opposite, very small and probably immature during anthesis, inconspicuous, hidden in the dense inflorescences, elliptic, about 1 cm. long and 4 mm. wide, acute at the apex and base, with a few appressed antrorse teeth along the upper margins above the middle, pilosulous on both surfaces; inflorescence axillary, clustered, conspicuous during anthesis, sometimes on very much abbreviated twiglets at each axil; peduncles filiform, 4—8 mm. long, puberulent; heads small, subglobose or flattened, about 5 mm. long, 5—10 mm. wide during anthesis; bractlets ovate, 3—5 mm. long, about 3 mm. wide, subacute at the apex, purplish-green when fresh, decidedly purple when dry, pilosulous; flowers included by the bractlets.

The type of this distinctive species was collected by Rogers McVaugh (no. 23036) on summits of the driest hills near the ocean between Barra de Navidad and Playa de Cuastecomate, Jalisco, Mexico, in a tropical deciduous forest with Forchammeria, Astronium, and Bursera, at an elevation of 50 meters abover sea-level, on March 16, 1965, and is deposited in the herbarium of the University of Michigan. The collector notes that the species was "occasional".

LIPPIA MICHOACANA Moldenke, sp. nov.

Arborescens; foliis inter anthesin parvis usque ad 1.5 cm. longis 1 cm. latis obovate-subrotundatis supra sparsissime pilosis, subtus in venis venulisque principalibus dense pilosis apicem versus paucidentatis; inflorescentiis axillaribus numerosis, capitulis breviter pedunculatis subglobosis 1.5—2 cm. latis; bracteolis viridulo-albis pilosis ciliolatis.

Treelike, to 6 m. tall; branches and branchlets very twiggy, glabrate, gray; twigs tetragonal, more or less scattered-pilose with elongate hairs; leaves decussate-opposite, small at time of anthesis, very short-petiolate or subsessile; petioles filiform, to 1 mm. long, densely hirsutulous; leaf-blades obovate-subrotund, to 1.5 cm. long and 1 cm. wide during anthesis, rather uniformly

green on both surfaces, mostly rounded or retuse at the apex, acute or subacute at the base, usually with a very few rounded and appressed teeth at the apex, very sparsely scattered-pilose above, densely pilose on the larger veins beneath; inflorescence axillary, numerous; peduncles filiform, 5—15 mm. long, rather densely hirsute with long antrorsely spreading hairs; heads subglobose, about 1 cm. long, 1.5—2 cm. wide; bractlets ovate, greenish-white during anthesis and when dry, acute or subacute at the apex, pilose and ciliate; flowers included, inconspicuous; corolla greenish-white.

The type of this species was collected by Rogers McVaugh (no. 22869) on hills in a deciduous forest ("now nearly leafless") along the road to Aguililla, 15—25 km. south of Rio Tepalcatepec bridge, which is about 30 km. southwest of Apatzingán, Michoacán, Mexico, with Bursera, Ipomoea, and various legumes, at 350—450 meters altitude, on March 7, 1965, and is deposited in the herbarium of the University of Michigan.

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BOOK REVIEWS

Alma L. Moldenke

"Organization and Evolution in Plants" by C. W. Wardlaw, xiii & 499 pp., illus. Longmans, Green & Company, Ltd., London W.1 1965. 60 sh.

This is a very thoughtful, logical treatment of these important and interrelated topics in plants. In fact, the author treats evolution as "essentially a progressive elaboration of organization" and primary organization in any vascular plant as the "integrated action of three main groups of factors": (1) those determining the inception of primary organogenic patterns in meristems, (2) those contributing to the elaboration of maturing regions, (3) specific genetical and other factors determining the sequential syntheses of enzymes, hormones, etc. He describes fully and critically such various theories of organization as: holistic, morphological, physiological, physical and mathematical, protoplasmic, genetical, and integrative.

Listing here the ten principles of organization that the author develops will indicate the approach of this book:

1. Organization involves energy and substances so interrelated and structurally evolved as to constitute viable functional systems, capable of self-maintenance and of being transmitted in heredity.
2. The unit of biological organization and heredity is the embryonic cell of nucleus, organelles, or their precursors.
3. Both chemical and physical attributes of metabolic processes make distinctive contributions to organization.

4. Biological patterns are an expression of the attainment of dynamic equilibrium in complex individual physico-chemical systems, described as organismal reaction systems.
5. The way in which a particular cell becomes differentiated is not only related to its position in the plant, but also to its functioning as a component of a coherent tissue which is characteristically determined as a whole.
6. However essential, or limiting, in morphogenesis and organization a particular substance may be, it can only produce its effect when it acts as a component of the integrated reaction system in an embryonic or meristematic cell or region.
7. Differently constituted reaction systems may yield comparable primary patterns; and the same reaction system may yield different primary patterns at different stages in ontogenesis.
8. The progressive organization which becomes manifest during ontogenesis is the result of many interrelated serial processes; genetical, organismal, and environmental stimuli are involved in the induction and regulation of the successive phases of development.
9. The physiological factors which determine reciprocal relationships of various kinds contribute significantly to the organization of the individual plant.
10. Integration is an essential condition for the endurance of organismal reaction systems and for the development of adaptive features.

There is much more of value in the book. The illustrations are a definite asset. The most impressive one to me is on p. 402 showing the long, convoluted, filamentous suspensor of Sequioa with the legend "It is hard to accept that the embryogenesis of gymnosperms epitomizes either precise adaptation or the principle of economy". There is a useful index. The copy is neat and accurate except for the slip - "referred back" - on p. 303. My only regret is that the writing style is not conducive to compelled, continued reading, to the probable loss to students assigned this valuable reading.

"Botany: A Laboratory Manual" by Shirley R. Sparing, Walter H. Muller, and William L. Theobald, viii & 181 pp., illus. Macmillan Company, New York, & Collier-Macmillan, Ltd., London. 1966. $3.50

This looseleaf laboratory companion to the text "Botany: A Functional Approach", by Walter R. Muller, one of the above listed authors, is richly planned for a semester course. It can also easily be adapted to other similar texts.

Qualitatively it is several notches above the multifarous intelligence-cramping collections of miserable work sheets that have been flooding the text market for decades. The direction of attention to important items, the use of really good illustrations, the thought provoking questions, the reasonable limitation of drawing demands, and the sending of the students outside the lab for plant materials are commendable. [Some instructors forget that

that is where plants live].

A few suggestions for improvement would be: requesting sketches on p. 45 to establish a visual image of assorted leaf types, leaving spaces after the questions for their replies on pp. 39 and 47, labeling all illustrations not only as to book source but surely as to plant source on pp. 13, 36, 37, and 38, and adding more modern and detailed experimental material on photosynthesis and respiration.

"Primary Photoprocesses in Biology" by J. B. Thomas, vi & 323 pp., illus., North-Holland Publishing Company, Amsterdam, and John Wiley & Sons., Inc. - Interscience Publishers Division - New York, 1965. $11.50

This book presents at first a general view of the biological, chemical and physical photoprocesses, and secondly and comparatively individual considerations of the primary photoreactions of several visible light-dependent life processes through the formation of products functioning only as initial reactants in the chain of chemical "dark" reactions. Vital photophenomena start with the consistent act of light absorption and then follow an amazing number of divergent processes. There is an excellent survey of the major photobiologically active pigments - chlorophylls, retinal-opsins, carotenoids, biliproteins, riboflavins and phytochrome. Well developed chapters are devoted to photophenomena: photosynthesis described by the author as "a reduction of carbon dioxide upon illumination resulting in the production of organic matter and oxygen, vision which - in contrast to the former - is cybernetic rather than energetic, phototaxis which is positive or negative and topophic or phobic light-induced motion of a free biological object, photokinesis which is light-induced change in an organism's motility, photodinesis or the effect of light on the rate and the intensity of protoplasmic streaming, phototropism similar to phototaxis except that it is limited to movement of a part of a plant or a simple sessile animal, photomorphogenesis broadly defined as a light-controlled or light-and-dark-controlled formative effect ranging all the way from seed germination to bird migration, and bioluminescence in many different plant and animal species in which the visible light emitted directly or symbiotically is a product rather than an agent as in all previous cases.

This book is well planned for the graduate or advanced undergraduate level for use in biophysics, biochemistry and related courses. It is well indexed. The copy is neat except for the misspelling of criticiz (or s) ed on p. vi and the garbling of sentence structure on p. v.

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YES, THANK YOU; WE LOVE FERNS

Otto Degener & Isa Degener

Dr. W. H. Wagner, Junior's article on "Pteridology in Hawaii," appearing in the Newsletter of the Hawaiian Botanical Society 2: 117-123, 1963, will stimulate workers to renewed industry. There are three statements expressed to which we personally do not subscribe. First, to quote: "I do not agree with propaganda that the Hawaiian flora will soon disappear and that 'all is lost'." We believe ephemeral malihinis tend to lack the vision former and present kamaainas gradually acquire. Dr. J. F. Rock, not long before his passing, remarked that his recent visits to his old collecting grounds were like attending a funeral - so many of his plant friends had disappeared. How rapid Dr. Wagner's "soon" is for definite areas is debatable. "Soon," for example, caught up years ago with the dry native forest and Lipochaeta plains of West Molokai where the kane writer gathered such plants as Canthium, Gardenia, Nestegis, and Sesbania in 1928, all now represented in herbaria as vouchers to give an inkling as to what the flora there was like. Even in 1928, he failed to unearth the West Molokai Kokia cookei, at that time already extinct in the wild state. "Soon" is just around the corner for the Kanepuu forest, overrun with axis deer, of Lanai; the belt of forest southeast of Ulupalakua, Maui; and the Sesbania colony of Kaena Point, Oahu. "Soon" is somewhat deferred for the flora peculiar to Kaala, Oahu, where government buildings now stand; and the Waikamoi rain-forest of Maui where the endemics are being bulldozed aside for the planting of exotic timber trees. We fear how soon is "soon" for the native Hamakua forest of Hawaii whose remnant Walker, Tomich and Mendes at the head of the local Civic Improvement Committee are valiantly striving to save from being engulfed by the planting of sugarcane; and for square miles of native forest on the same island which are being bulldozed for the planting of Fraxinus uhdei. To dub as "propaganda" our efforts in behalf of true Conservation, not Exploitation for the purpose of garnering dollars and cents, is unfortunately a distinct disservice to the biotic and scenic welfare of our State.

Second, we do not believe "that there are really three different species of holly-fern, Polystichum, at the top of Mauna Haleakala in Maui, not two." We have studied this assemblage of plants repeatedly in the field, without haste while living among them near Holua Cave, and in several local and foreign herbaria. The two classical species form swarms of hybrids of almost all possible intergradations. To mistake one of these, as we mentioned in our Flora Hawaiiensis 1/18/63 and 3/15/63, as a distinct species is not difficult at all.

The third statement that "the time is now nigh for collecting

by specialists, rather than crude gathering or 'hay-baling' of all plants in sight," we consider a half-truth. We workers today feel frustrated when investigating a species to find that the type specimen possesses only the briefly written "Sandwich Islands" on the foxed, brittle label. How useful and fascinating it would be for us if the precise locality on the definite island had been recorded! The practice of collecting the same species time after time - evidently termed contemptuously as "hay-baling" - not only will give future, curious workers a more definite record as to the distribution at a precise date of various taxa, it will make accessible to botanists for research and teaching a wealth of useful material, perhaps of the same species but very unlikely always of the same taxon in an archipelago noted for the "variability of the species." The kane writer's gifts of Hawaiian plants to his alma mater in Massachusetts are to this day a considerable help as illustrative material not only for Taxonomy but even Freshman Botany courses. With this in mind, since 1922 he has likewise scattered duplicate specimens by sale and gift to the University of Michigan and other institutions of learning throughout the World. Our aim, living in a fast-vanishing endemic flora, is to make hay while the sun shines, and we advise our amateur and professional colleagues to do likewise. Is it wise to lull them into complacency?

Were our public herbaria deprived of the riches collected by such "amateurs" as the horticulturist Douglas; Chaplain Diell; planter Baldwin; Director Brigham and the tubercular college youth Horace Mann, Jr.; physician Hillebrand; rancher Munro; accountant Topping; and the youngster Rock who studied to enter the priesthood and never took a formal college course in Botany; what a vast hiatus would prevail in our faulty knowledge of the Hawaiian flora! When did the amateur Rock, for instance, become a specialist? No, the specialist sorely needs the help of amateurs of whom the present day can list such names as Brash, Bush, Desha, Kato, McGuire, Obata, Pang, Pekelo, Roe and many others.

As it is impossible to publish authoritatively about any group of plants whatsoever without familiarity with their literature, we herewith add a Supplement to "Some Recent References on Hawaiian Pteridology" appearing on page 123 of Dr. Wagner's article in the November Newsletter. As our work is incomplete, we hope our readers will contribute further supplements with the aim not only of getting but for evermore keeping Dr. Merrill's famous bibliography of species nicknamed "The Pink Slips" complete at least so far as the Hawaiian Islands are concerned. To do so, the species mentioned in these articles must be transcribed in the Merrill method and the transcriptions intercalated with their fellows reposing in the Marie C. Neal Herbarium of the B. P. Bishop Museum.

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BOOK REVIEWS

Alma L. Moldenke

"Biosynthetic Pathways in Higher Plants" edited by J. B. Pridham and T. Swain, xi & 212 pp., illus., Academic Press, London & New York. 75 sh. or $12.00

These valuable papers are the proceedings of the 1964 Plant Phenolics Group Symposium held at the University of Leeds, mostly British in authorship, and covering the biosynthesis of carotenoids, terpenoids, amino acids, proteins, nucleotides, sugars, starches, cellulose, lignin, piperidine alkaloids, chlorophylls, and plant di- and tri-carboxylic acids. There is a general discourse on the interrelationships among tissues, cells, organelles and the biochemical phenomena occurring therein. There is another descriptive of the various techniques used in these biochemical studies.

Because the level of approach is both advanced and well explained this book can serve as a really useful source of information for many students, workers and instructors in all related fields. Fine copy, diagrams, illustrations and indexes add to the value of the book.

"Comparative Phytochemistry" edited by T. Swain, xiii & 360 pp., illus., Academic Press, London & New York. 93 sh. or $14.75

Like the above-mentioned book, this one consists of papers presented at a symposium by the Phytochemical Group in Cambridge in 1965 and represents the organizational work of one of the same editors. Since it describes the progress of research of the most recent years of this newly established branch of science and the

implications that may be drawn, it will serve as a useful source book to both botanists and chemists. Heywood's "Phytochemistry and Taxonomy", Mentzer's "Biogenetic Classification of Plant Constituents", and Alston's "Chemotaxonomy or Biochemical Systematics" are the introductory papers. They are followed by detailed ones on the distribution and synthesis of alkanes, natural acetylenes, terpenoids, carotenoids, polysaccharides, asperulosides, aucubins, ramunculin, sulphur compounds, amino acids, alkaloids and their phytochemistry, betacyanins, betaxanthins, hydroxyquinones, flavonoids, and dihydrochalones. The results of the detailed studies on Lathyrus, Vicia and Ramunculus convincingly demonstrate the need for and value of this field of endeavor.

Like the above-mentioned book, the copy is clean (except for an error in sentence structure on p. 53), the diagrams and indexes helpful.

"The Romance of the Fungus World" by R. T. & F. W. Rolfe, xx & 309 pp., illus. Johnson Reprint Corp., London W.1 & New York 10003. (original 1925) 1966.

Way back in my high school student days I was completely fascinated with the first edition of this book and was so sure for a few months at least that I would just have to become an amateur or professional mycologist. The Rolfes, who set as their goal in this writing the overcoming of the strictly British - not human - "fungophobia", were very convincing. How good that this book, long out of print, is now available again through the Johnson reprint services. It will appeal to so many different readers because of its charm, its botanical accuracy, and its historical and literary materials.

The chapters deal with fungi in mythology, folklore, and fiction, their structure, function, and life histories, their damaging activities effecting man, their uses in medicine, industry, and food, their poisonous members, their special curious phenomena such as extremely rapid growth and decay, color changes, luminescence, "red rain fall", and the fascinating hobbies of their field study and their influence in history. On p. 76 "vitamins" are omitted from the list of essential foods even though they were known at the time that the text was originally written. The biblical, classical, medieval and Shakespearean references are particularly interesting. So is the recording of the first legal enactment back in 1660 of plant disease prevention through the destruction of barberry, the listings of various spellings for "toadstool" and "mushroom" since 1389, Pliny's recorded use of dried mushrooms as tinder, the production of green Tunbridge ware from mycelia-ridden oak, and the explanation of how the unknowing peasant preparation of both poisonous and nonpoisonous mushrooms by decanting the fluid in which they were boiled or preparing them with vinegar made for safe eating by removing the noxious alkaloids. The many photographs do not have the clarity of those in the original edition, but they are still fairly good.

NOTES ON BROMELIACEAE, XXIV

Lyman B. Smith

UNITED STATES

TILLANDSIA BARTRAMII Ell. Bot. S. C. & Ga. 1: 379. 1817.
Tillandsia juncea sensu LeConte, Ann. Lyc. N. Y. 2: 130. 1826; Mez in DC. Mon. 9: 676. 1896, quoad pl. Florid., non Poir.
? Tillandsia pinifolia LeConte, Ann. Lyc. N. Y. 2: 131. 1826.
Tillandsia tenuifolia sensu Mez in DC. Mon. 9: 674. 1896; Small, Fl. Se. U. S. 245. 1903, quoad syn. Tillandsia bartramii Ell.
Tillandsia simulata Small, Man. Se. Fl. 270, 1503. 1933.
Tillandsia myriophylla Small, Man. Se. Fl. 270, 1503. 1933.

UNITED STATES: GEORGIA: On old trees in the Mortar Swamp, Liberty County, Lewis LeConte s. n. (CHARL, holotype, phot. GH; NY, isotype).

FLORIDA: Manatee River (Manatee County), June 1878, A. P. Garber s. n. (NY, lectotype of Tillandsia simulata Small; US, isotype). Hammock south of Brooksville, (Hernando County), May 13, 1931, J. K. Small & E. J. Alexander s. n. (NY, type of Tillandsia myriophylla Small).

In the extreme southeastern United States, the group of species in Tillandsia subgenus Tillandsia with very narrow fasciculate leaves is extremely confused and confusing, and I fear that my efforts in the North American Flora in 1938 did little to improve the situation. There, following previous authors, I misapplied T. juncea (R. & P.) Poir., a species that has a very densely digitate involucrate inflorescence and that ranges from Mexico and the West Indies to Peru and Bolivia. Up to the present, I have seen no authentic material of Tillandsia juncea from Florida.

It is possible to separate T. setacea Sw. (T. tenuifolia auctt., non L.) from the remainder of this complex on its leaves alone, which have very narrow sheaths, and blades that are thin, completely involute, strongly ribbed, and about 0.5 mm in diameter at mid-point (Pl. I, fig. 1: Small & Mosier 5506), while those of the remainder are crescent-shaped in section and at least 1 mm in diameter at mid-point (Pl. I, fig. 2: LeConte). T. setacea is limited to the southern half of Florida, while the remainder of the complex is rare there but common in the northern half and adjacent Georgia.

I have tried to find characters to separate the remainder of this complex both in the descriptions of LeConte and in those of Small and also independently, but so far in vain. The oldest name is T. bartramii Ell. and judging from the descriptions, T. pinifolia of LeConte belongs here, while his T. caespitosa appears to be a synonym of T. setacea. Types of two of Small's species have been located as indicated above, but T. hystricina remains a mystery with indications of relationship elsewhere be-

cause of the leaves with "stiff nearly knife-like tips".

In conclusion I should say that for some years research has been going on with the purpose of distinguishing entities in this complex, but until that is successful there is no choice but to use T. setacea and T. bartramii for the southern and northern species respectively.

TILLANDSIA FASCICULATA Sw. var. CLAVISPICA Mez in DC. Mon. Phan. 9: 682. 1896.

Tillandsia bracteata Chapm. Fl. So. U. S. 471. 1860, non Vell. 1825.

UNITED STATES: FLORIDA: "South Florida", Chapman s. n. (NY, lectotype of Tillandsia bracteata Chapm.).

Chapman's description of his Tillandsia bracteata is so ambiguous that it is impossible to place it among the few species of Florida without material, and that is poorly labelled. However, all material so labelled, whether by Chapman or later collectors, is T. fasciculata Sw. In Florida, the common variety of T. fasciculata and undoubtedly the major element in Chapman's species is var. densispica Mez, but it is interesting to note the occurrence of the common Cuban var. clavispica Mez in southern Florida and so I am choosing the lectotype in the latter variety. After all, T. bracteata Chapman is a later homonym and consequently its typification is of minimal importance.

TILLANDSIA INCURVA Griseb. Nachr. Ges. Wiss. Goett. "1864": 15. 1865.

My Florida record for Tillandsia incurva Griseb. (North American Flora 19: 148. 1938) was based upon an unnumbered specimen collected by Blodgett at Key West (NY). Although the form of its inflorescence very closely resembles that of T. incurva, a careful restudy shows that it can not belong to that species because of its carinate short-connate posterior sepals and narrower paler leaf-sheaths. I now believe that the specimen is a hybrid of a dominant T. valenzuelana A. Rich. with some larger species such as T. fasciculata Sw. that would account for the much larger floral bracts and sepals.

In any event, T. incurva should be removed from the list of Florida species. Whether there will ever be an authentic record is dubious, for although Cuban species like T. pruinosa are discovered in southern Florida from time to time, T. incurva is mainly a species of mountain rainforest and could scarcely find a suitable habitat there.

MEXICO

PITCAIRNIA BREEDLOVEI L. B. Smith, sp. nov.

P. jimenezii L. B. Smith atque P. xanthocalyx Mart. in systema mea proxima sed sepalis posterioribus alato-carinatis differt.

PLANT with a short erect stem covered with old leaf-sheaths, flowering 66–86 cm high. LEAVES all alike, fasciculate at the apex of the stem, to 5 dm long, entire; sheaths suborbicular,

15-20 mm long, dark castaneous, glabrous at least with age; blades linear, slightly contracted at base, filiform-acuminate, 10-15 mm wide, covered with fine appressed cinereous scales beneath, glabrous above. SCAPE erect, slender, white-flocculose; scape-bracts erect, the lowest subfoliaceous and imbricate, the highest narrowly triangular, filiform-laminate, shorter than the internodes. INFLORESCENCE few-branched, lax, laxly white-flocculose; primary bracts narrowly triangular, much shorter than the naked sterile bases of the short few-flowered lateral branches; floral bracts ovate, acuminate, shorter than the slender spreading 13 mm long pedicels. SEPALS oblong, rounded and apiculate, 16 mm long, the anterior ecarinate, the posterior alate-carinate. PETALS 4 cm long, pale yellow, bearing an oblong truncate scale at base. STAMENS included. OVARY 3/5 superior. SEEDS shortly bicaudate. Pl. I, fig. 3: Flower x 1; fig. 4: Anterior sepal x 1; fig. 5: Posterior sepal x 1.

MEXICO: Chiapas: Mun. Ixtapa: On rocks, steep slope with Quercus, along Mexican Highway 190 in the Zinacantán paraje of Muctajoc, alt. 1050 m, 30 October 1965, D. E. Breedlove 13991 (US, type; DS). Chiapa, alt. 1350 m, M. B. Foster 2963 (US, paratype)

SALVADOR

GREIGIA ROHWEDERI L. B. Smith, sp. nov.

A G. van-hyningii L. B. Smith, cujus bracteas valde imitans, foliorum vaginis inconspicuis, bracteis primariis pallidioribus serratisque differt.

PLANT known only from fragments. LEAVES over 2 meters long, covered beneath with coarse pale appressed scales, soon glabrous above; sheaths inconspicuous, pale brown toward base; blades linear, acuminate, somewhat narrowed toward base, to 38 mm wide, green, bearing a pale median stripe when dry, laxly and subregularly serrate with pale teeth 0.5 mm long. SCAPES to 6 cm long, strongly flattened and alate; scape-bracts narrowly triangular, acuminate, pungent, 5-8 cm long, pale castaneous, sparsely pale-lepidote, entire. INFLORESCENCES complanate-capitate, compound, 6 cm high; primary bracts like the scape-bracts but serrate; floral bracts narrowly lance-triangular, 33 mm long, thin except for the pungent castaneous apex, entire, sparsely pale-lepidote. SEPALS like the floral bracts, 23 mm long. Pl. I, fig. 6: Primary bract x 1; fig. 7: Sepal x 1.

SALVADOR: Santa Ana: Epiphytic and terrestrial in cloud forest Hacienda Montecristo, north of Metapán, alt. 2200 m, 27 August 1951, O. Rohweder no. El Salvador 526 (F, type; phot. US).

It is very difficult to judge specific limits in Greigia because of the very scanty collecting and the fragmentary nature of most collections. However, additional material of G. van-hyningii has confirmed the importance of the characters of dark conspicuous leaf-sheaths, dark leaf-spines, and acuminate dark castaneous mostly entire primary bracts, and thus the characters taken to distinguish G. rohwederi seem reasonably secure.

.....

VENEZUELA

PITCAIRNIA ALTENSTEINII (Lk., Kl. & Otto) Lem. var. MINOR L. B. Smith, var. nov.

A var. altensteinii scapi bracteis superioribus quam internodiis brevioribus, inflorescentia brevi, basi latibracteata differt.

SCAPE-BRACTS shorter than the upper internodes. INFLORESCENCE short-cylindric or subglobose, to 11 cm long; basal floral bracts broad. Pl. I, fig. 8: Inflorescence x 1/2.

VENEZUELA: Aragua: Alto de Choroni, alt. 800-1400 m, V. M. Badillo 1920 (Universidad Central de Venezuela). Same, alt. 800-1300 m, 8 May 1949, Badillo 1928 (UCVEN). Same, 12 June 1952, Schnee 953 (UCVEN). Same, terrestrial in rich soil in full sun, alt. 1950 m, 5-6 April 1962, T. R. Soderstrom 975 (US, type).

PUYA FLOCCOSA (Linden) E. Morr. var. COMPACTA L. B. Smith, var. nov.

A var. floccosa inflorescentiae ramis brevibus dense florigeris bracteas primarias subduplo superantibus differt.

INFLORESCENCE with branches 2-3 cm long including the naked sterile base, about twice as long as the serrulate rose primary bracts. Pl. I, fig. 9: Branch x 1/2.

VENEZUELA: Mérida: On rocks, July 1846, Funck & Schlim 1055 (P, type).

COLOMBIA

GUZMANIA BICOLOR L. B. Smith, sp. nov.

A G. graciliore (André) Mez, cui affinis, foliorum vaginis omnino castaneis haud striatis, laminis subduplo angustioribus, scapi bracteis omnibus longe laminatis differt.

PLANT caulescent; stem at least 35 cm long; flowering shoot 20 cm long. LEAVES erect, very densely imbricate, 20-25 cm long; sheaths ovate, 4 cm long, dark castaneous and covered with fine closely appressed scales beneath; blades linear, acuminate, flat, 7 mm wide, pale and appressed-lepidote above, dark and glabrous beneath. SCAPE erect, very slender; scape-bracts erect, densely imbricate, foliaceous but reduced. INFLORESCENCE laxly bipinnate 9 cm long, sparsely white-lepidote; primary bracts spreading, broadly ovate, red, shorter than the spikes but the lowest with foliaceous blades exceeding them; spikes more or less secund, subdensely 3-4-flowered, to 27 mm long including the naked sterile base, yellow; floral bracts elliptic, 9 mm long, thin, nerved, the lower carinate and incurved; flowers subsessile, erect, more than 2-ranked. SEPALS oblong, obtuse, 11 mm long, equally connate for 4 mm, carinate toward base. PETALS 20 mm long. Pl. I, fig. 10: Branch x 1/2; fig. 11: Sepals x 1.

COLOMBIA: Valle: Rocky hillside near quebrada, in forest near km 58 on the highway between Cali and Buenaventura, 12 August 1965, F. A. Barkley & L. E. Willard 35472 (US, type).

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BRAZIL

AECHMEA BAHIANA L. B. Smith, sp. nov.

Ae. tomentosa Mez atque Ae. stelligera L. B. Smith affinis, a priore bracteis primariis angustioribus, axibus gracilibus, a posteriore bracteis primariis omnibus magnis et ramos multo superantibus, a ambobus sepalis utrinque late alatis differt.

PLANT flowering over 1 m high. LEAVES 7 dm long; sheaths elliptic, ample, to 3 dm long, castaneous beneath toward base, subdensely vestite with appressed brown-centered scales; blades ligulate, acuminate, 7 cm wide, densely and finely purple-spotted, subdensely lepidote beneath, becoming glabrous above but essentially concolorous, subdensely serrate, the apical spines recurved, 2 mm long. SCAPE erect, slender, densely vestite with pale stellate appressed scales; scape-bracts densely imbricate and wholly covering the scape, the lowest subfoliaceous, the highest elliptic, apiculate, nearly 2 dm long, entire, chartaceous, red. INFLORESCENCE cylindric, over 3 dm long (immature), lax at least toward base, 3-pinnate, pale-lepidote except the petals and older sepals; primary bracts like the upper scape-bracts, divergent, decreasing evenly in size, much exceeding the short subdense branches; spikes 1-4 on each branch, subdensely few-flowered; floral bracts narrowly triangular, spinose-acuminate, shorter than the ovary; flowers sessile, apparently more than 2-ranked, suberect. SEPALS free, strongly asymmetric but with broad wings on both sides, 16 mm long including the 2 mm mucro. PETALS ca. 3 cm long, bearing 2 short dentate scales at base; blades elliptic, obtuse. STAMENS included; pollen nearly spherical, ca. 50 u in diameter, reticulate, at least 6-porate. OVARY cylindric, 10 mm long; epigynous tube cylindric, 2.5 mm long. Pl. I, fig. 12: Branch x 1; fig. 13: Sepal x 1; fig. 14: Pollen x ca. 500.

BRAZIL: Bahia: Rio de Contas, Bom Jesus, August 1913, Luetzelburg 300 (M, type; phot. US).

BROMELIA EITENORUM L. B. Smith, sp. nov.

B. antiacantha Bertol. atque B. balansae Mez affinis, a priore bracteis florigeris sepalisque longis angustisque, a posteriore bracteis florigeris sepalisque haud carinatis, a ambobus habitu minore distinguenda.

PLANT stemless, flowering 8 dm high. LEAVES many in a bulbous rosette, 75 cm long; sheaths ample, 4 cm long, dark castaneous, densely and coarsely lepidote toward apex especially beneath, also serrulate; blades linear, acuminate, pungent, 40 mm wide, white-lepidote beneath expecially between the nerves, soon glabrous above, laxly serrate with slender uncinate brown 7 mm long spines. SCAPE erect, slender, covered with a persistent white tomentum; scape-bracts densely imbricate, the lowest foliaceous, the upper elliptic, reddish, bearing a short foliaceous blade. INFLORESCENCE subdensely bipinnate, subcylindric; axes white-tomentose; primary bracts elliptic, entire, the lowest short-laminate, the upper bladeless, about half as long as the few-

flowered fascicles, subchartaceous, soon glabrous; floral bracts oblong, obtuse, 2 cm long, about equaling the ovaries, thin, ecarinate, white, soon glabrous; flowers subsessile. SEPALS like the floral bracts, 15 mm long. PETALS erect, 23 mm long, glabrous, white at base, dark dull purple above. STAMENS included; filament-tube 8 mm long. OVARY slenderly ellipsoid, 2 cm long, white-flocculose. FRUIT broadly ellipsoid to 4 cm long, nearly even. Pl. I, fig. 15: Branch x 1/2; fig. 16: Sepal x 1.

BRAZIL; Maranhão: Mun. Lorêto: Edge of brook in flat "chapada" or semi-closed woodland, "Ilha de Balsas" region, between the Rios Balsas and Parnaiba, about 35 km south of Lorêto, ca. 7° 23' S, 45° 4' W, alt. 300 m, 15 April 1962, George & Liene T. Eiten 4312 (US, type; flowering); same, 3 April 1962, Eiten 3974 (US, fruit).

ORTHOPHYTUM Beer, Flora 37: 347. 1854; L. B. Smith, Brom. Brazil in Smithsonian Misc. Coll. 126: 179. 1955.
Prantleia Mez in Mart. Fl. Bras. 3, pt. 3: 257. 1891.
Sincoraea Ule, Bot. Jahrb. 42: 191. 1908.
Cryptanthopsis Ule, Bot. Jahrb. 42: 193. 1908.

Six additional species of Orthophytum have been discovered since my previous work, so a new synopsis is needed to show their relationship. Except for the caulescent habit of O. vagans, no new characters are added to this small genus by its more than fifty per cent increase in species. At the same time it is interesting to note that the disctediting of citations from Goiás and Mato Grosso now limits the range of the genus to a strip from Minas Gerais and Espirito Santo to Bahia and Paraíba.

1. Inflorescence sunk in the center of the leaf-rosette or of the terminal leaves, compact; scape lacking or short and hidden by the leaf-sheaths.
 2. Plant caulescent, branching; leaf-blades narrowly triangular, 5-10 mm wide. Espirito Santo.....1. O. vagans
 2. Plant stemless, but sometimes stoloniferous. Bahia.
  3. Leaf-blades linear, 30 cm long, the spines mostly antrorse; sepals narrowly triangular, 30 mm long.....2. O. navioides
  3. Leaf-blades narrowly triangular, 3-6 cm long, maximally 5-15 mm wide, the spines recurved; sepals 14 mm long.
   4. Leaf-blades only 5 mm wide, the spines 1 mm long; flowers short-pedicellate; sepals lanceolate, acute. 3. O. amoenum
   4. Leaf-blades 11-15 mm wide, the spines 2-3 mm long; flowers sessile; sepals narrowly triangular, acuminate. 4. O. saxicola
1. Inflorescence either raised above the leaves on a distinct scape or itself elongate.
 5. Inflorescence short and compact.
  6. Spines of the leaf-blade recurved, 2-3 mm long; leaf-blade 3-6 cm long; inflorescence simple; floral bracts much exceeding the flowers, recurved. Bahia.....4. O. saxicola
.....

..6. Spines of the leaf-blade predominantly antrorse; leaf-blades much larger.
7. Sepals oblong, 17-20 mm long, densely lanate; flowers fasciculate, inflorescence compound, subglobose. Minas Gerais.....5. O. mello-barretoi
7. Sepals narrowly triangular, 12-15 mm long, not strongly vestite.
8. Floral bracts straight, about equaling the flowers; flowers spicate; inflorescence digitate. Bahia.
6. O. rubrum
8. Floral bracts recurved, the lower ones distinctly longer than the flowers.
9. Inflorescence simple, spicate. Espirito Santo.
7. O. fosterianum
9. Inflorescence compound, densely corymbiform. Minas Gerais.....8. O. compactum
5. Inflorescence elongate, lax at least toward base.
10. Upper primary bracts elongate, many times exceeding the fascicles of flowers.
11. Scape-bracts and primary bracts with broadly ovate sheaths abruptly contracted into very narrowly triangular blades; inflorescence dense toward apex; scape elongate. Espirito Santo.....9. O. foliosum
11. Scape-bracts and primary bracts without distinct sheaths, ligulate or linear, acuminate; inflorescence almost wholly lax; scape short. Minas Gerais, Espirito Santo.
10. O. duartei
10. Upper primary bracts short, scarcely more than twice as long as the fascicles of flowers.
12. Scape-bracts lanceolate, abruptly acuminate; sepals 10 mm long. Minas Gerais.
13. Leaf-spines 8 mm long; inflorescence lanate especially on the axis.....11. O. leprosum
13. Leaf-spines 2 mm long; inflorescence glabrous.
12. O. glabrum
12. Scape-bracts linear-triangular, long-caudate.
14. Inflorescence simple, the bracts 1-flowered, but the lowest remote. Espirito Santo.....7. O. fosterianum
14. Inflorescence compound, the larger bracts with fascicles or spikes of axillary flowers.
15. Scales of the leaves wholly appressed, suborbicular, subentire; sepals 14-15 mm long.
16. Inflorescence dense for about half of its length. Bahia.....13. O. maracasense
16. Inflorescence lax except for the extreme apex. Espirito Santo.....14. O. sanctum
15. Scales of the leaves more or less spreading and lacerate
17. Sepals maximally 8-11 mm long; leaf-scales coarsely lacerate, subspreading, deciduous above with age.
17. Sepals maximally 14-15 mm long; leaf-scales finely and deeply lacerate, spreading, persistent on both sides. Minas Gerais.....16. O. magalhaesii

1. O. VAGANS M. B. Foster, Bromel. Soc. Bull. 10: 59, figs. 1960.

BRAZIL: Espirito Santo: Source unknown, cultivated in Rio de Janeiro, R. G. Wilson 578 (US, type).

2. O. NAVIOIDES (L. B. Smith) L. B. Smith, Brom. Brazil in Smithsonian Misc. Coll. 126: 34, 179. 1955. Cryptanthopsis navioides L. B. Smith, Contr. Gray Herb. 129: 31, pl. 3, figs. 4-6. 1940.

BRAZIL: Bahia: On perpendicular rocks above stream in isolated ravine, Jacobina, alt. 500 m, 16 June 1939, Foster 90 (GH, type; R, US).

3. O. AMOENUM (Ule) L. B. Smith, Brom. Brazil in Smithsonian Misc. Coll. 126: 33, 179. 1955. Sincoraea amoena Ule, Bot. Jahrb. 42: 191, fig. 1 A-F. 1908; Mez, Pflanzenreich IV. 32: 9, fig. 3. 1934. Pl. I, fig. 17: Flower x 1; fig. 18: Petal and stamens x 1 (after Ule).

BRAZIL: Bahia: On rocks, Serra do Sincora, alt. 1400 m, (November 1906), Ule 7106 (B, type).

4. O. SAXICOLA (Ule) L. B. Smith, Brom. Brazil in Smithsonian Misc. Coll. 126: 34, 179. 1955. Cryptanthopsis saxicola Ule, Bot. Jahrb. 42: 193, fig. 1 G-K. 1908. Pl. I, fig. 19: Flower x 1 (after Ule).

BRAZIL: Bahia: On rocks, near Maracas, alt. 1000 m, September 1906, Ule 7031 (B, type). Same, 21 October 1948, Foster 2471-A (US). Very dry table rock area between Bahia and Milagres, alt. 450 m, 18 October 1948, Foster 2441 (US).

Ule considered his genera Sincoraea and Cryptanthopsis as most closely related to the Chilean Fascicularia, apparently on the basis of the non-porate non-plicate pollen and the appendaged petals in that order. The sessile inflorescence was doubtless considered also. He distinguished both genera from Fascicularia by their adnate inner filaments, long styles, and highly adnate petal-scales. Ule must have been following Mez's 1896 monograph in giving this position to his genera, and Mez vindicated this action in the key to genera in his 1934 monograph.

I followed this system in describing Cryptanthopsis navioides in 1940, but in 1948 Mulford Foster collected material of C. saxicola that showed transition from the typical form in adverse conditions to a more luxuriant and distinctly scapose type indistinguishable from a dwarf Orthophytum. The reduction of Sincoraea and Cryptanthopsis to Orthophytum is based then on the unreliability of the pollen character which has failed to correlate with other floral characters in a number of cases, as well as on the positive characters of similarities of other floral structure and of geographical distribution.

5. O. MELLO-BARRETOI L. B. Smith, Bol. Mus. Nac. Rio de Janeiro nov. ser. no. 15: 2, pl. 1, figs. c-e. 1952.

BRAZIL: Minas Gerais: Mun. Jaboticatubas: Palacio, Serra do Cipó, km 127, 3 September 1933, Mello Barreto 2121 (R, type; US). Same, Mello Barreto 7665 (R). Serra do Cipo, Foster 631 (GH); Pires & Black 2719 (IAN).

6. O. RUBRUM L. B. Smith, Brom. Brazil in Smithsonian Misc.

Coll. 126: 34, 180, fig. 83. 1955.

BRAZIL: Bahia: Table Rock near Maracas, 1948, Foster 2444 (US, type).

7. O. FOSTERIANUM L. B. Smith, Bromel. Soc. Bull. 8: 24, fig. 1958.

BRAZIL: Espirito Santo: Near Santa Teresa, 26 October 1948, Foster 2487-A (US, type).

8. O. COMPACTUM L. B. Smith, sp. nov.

O. foliosum L. B. Smith valde simulans, sed inflorescentia omnino compacta haud interrupta, bracteis haud recurvato-serratis, sepalis minoribus differt.

PLANT with slender rhizomes; flowering shoot 2 dm high. LEAVES 50-65 cm long, covered beneath with finely divided whitish scales, soon glabrous above; sheaths small and inconspicuous; blades linear, acuminate, 23 mm wide, laxly serrate with antrorsely uncinate or spreading pale brown spines 1.5 mm long. SCAPE erect, 7 mm in diameter, white-flocculose; scape-bracts foliaceous, much exceeding the inflorescence. INFLORESCENCE densely compound from few-flowered fascicles, subglobose, 5 cm high, soon glabrous; lower primary bracts spreading, foliaceous, large, the upper broadly ovate, acuminate, serrate with spreading or antrorse spines; floral bracts like the upper primary bracts, about as long as the flowers, recurved, whitish; flowers sessile. SEPALS free, narrowly triangular, acuminate, 13 mm long, nerved, the posterior ones alate, PETALS white, bearing 2 highly adnate scales, the blades elliptic, obtuse. STAMENS included. OVARY narrowed at base, 8 mm high, strongly compressed and alate with the sepals. Pl. I, fig. 20: Flower x 1.

BRAZIL: Minas Gerais: Terrestrial on rocky slopes by the highway from Nanuque to Teofilo Otoni, 14 August 1965, R. P. Belem 1626 (US, type; hb. Univ. Brasilia).

9. O. FOLIOSUM L. B. Smith, Arquiv. Bot. Estado São Paulo nov. ser. 1: 58, pl. 74. 1941.

BRAZIL: Espirito Santo: On side of a rock in semi-moist condition but in full sun, Santa Teresa, 27 July 1939, Foster 288 (GH, R, US; one specimen of US erroneously cited in Brom. Brazil as no. 2487). Same, 6 August 1940, Foster 881 (GH, US; one specimen of GH erroneously cited in Brom. Brazil as no. 1079 from Camizão, Mato Grosso). Here Mulford Foster has conscientiously rectified an error that gave a very misleading idea of the geographic distribution of Orthophytum foliosum.

10. O. DUARTEI L. B. Smith, sp. nov.

A O. folioso L. B. Smith, cui parum affinis, scapi bracteis et bracteis primariis indistincte vaginatis, inflorescentia fere omnino laxa, scapo brevi, bracteis florigeris integris differt.

PLANT stemless but propagating by very slender rhizomes flowering 22 (16-26) cm high. LEAVES typically 23 cm long and 25 mm wide, covered with white appressed scales, becoming glabrous above; sheath scarcely broader than the blade, ovate; blade ligulate or linear, acuminate, laxly repand-serrate with spreading or antrorse broad flat spines 0.5-1.5 mm long. SCAPE erect, slender

very short, naked or with a few foliaceous bracts. INFLORESCENCE elongate, lax almost throughout, compound from few-flowered fascicles; primary bracts foliaceous, mostly large but the upper reduced; floral bracts straight, narrowly triangular, 10 mm long, exceeded by the sepals, entire, thin, nerved, pale-lepidote; flowers sessile. SEPALS like the floral bracts but lanceolate, mucronate, 10 mm long, the posterior ones alate. PETALS imperfectly known, slightly exceeding the sepals. Pl. I, fig. 21: Apex of inflorescence x 1/2; fig. 22: Flower x 1.

BRAZIL: Minas Gerais- Espirito Santo: In colonies in fields associated with other Bromeliaceae or with Velloziaceae, between Nanuque and northern Espirito Santo, 10 November 1953, A. P. Duarte 3910 (US, type; RB 94378). Rio Itaunas, 1953, A. P. Duarte s. n. (RB 94376). Same, cultivated, 7 November 1953, A. P. Duarte 3909 (RB, form with longer narrower leaves, possibly due to cultivation).

11. O. LEPROSUM (Mez) Mez in DC. Mon. Phan. 9: 117. 1896. Prantleia leprosa Mez in Mart. Fl. Bras. 3, pt. 3: 259, pl. 58, fig. 2. 1891.

BRAZIL: Without locality, Glaziou 14035 (K, US phot. 4184). Minas Gerais: Cachoeira do Inferno, Rio Jequetinhonha, (September 1820), Pohl 5229 (W, type, formerly cited as from Goiás). Banks of the Rio Mucuri, Nanuque, 10 February 1953, A. P. Duarte 3636, J. C. Gomes 422 (RB, US).

12. O. GLABRUM (Mez) Mez in DC. Mon. Phan. 9: 117. 1896. Prantleia glabra Mez in Mart. Fl. Bras. 3, pt. 3: 258, pl. 58, fig. 1. 1891; Pflanzenreich IV. 32: 72, fig. 19. 1934.

BRAZIL: Minas Gerais: São Miguel, Rio Jequetinhonha, (August 1820), Pohl 3436 (BR, type; GH phot. 2792).

13. O. MARACASENSE L. B. Smith, Brom. Brazil in Smithsonian Misc. Coll. 126: 33, 180, fig. 84. 1955.

BRAZIL: Bahia: Table Rock area near Maracás, alt. 900 m, 21 October 1948, Foster 2471 (US, type; US phot. 4245).

14. O. SANCTUM L. B. Smith, Bromel. Soc. Bull. 12: 32, fig. 1962.

BRAZIL: Espirito Santo: Near Santa Teresa, alt. 900 m, 7 August 1940, Foster 846 (US, type).

15. O. DISJUNCTUM L. B. Smith, Brom. Brazil in Smithsonian Misc. Coll. 126: 33, 180, fig. 85. 1955.

15a. Var. DISJUNCTUM. Flowering 35-50 cm high. Sepals 11 mm long.

BRAZIL: Paraíba: On rocks at Queimada, between Campina Grande and Caruarú (in Pernambuco), alt. 450 m, 11 October 1948, Foster 2419 (US, type). Pernambuco: Mun. Quipapa: Engenheiro Pelada, 12 July 1950, Silva & Leal 247 (RB, US).

15b. Var. MINOR L. B. Smith, Phytologia 7: 255. 1960. Flowering 15 cm high. Sepals 9 mm long.

BRAZIL: Without locality, Instituto Biologico da Bahia 1083 (RB 97607). Pernambuco: Mun. Quipapa: On granatic outcrop of mountain, Uzina Agua Branca, Fazenda Pelada, 12 July 1950, D. A. Lima 50-592 (IPA, type; US phot. 5700).

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16. O. MAGALHAESII L. B. Smith, sp. nov.

A O. disjuncto L. B. Smith, cui affinis, foliis lepidibus patentibus profunde laceratis utrinque vestitis, sepalis majoribus differt.

PLANT flowering over 55 cm high, its base unknown, LEAVES (or basal scape-bracts) 50 cm long, covered throughout with a dense felt of spreading finely divided white scales; sheaths obscure, evidenced mainly by fine or no serration; blades very narrowly triangular, caudate-acuminate, very laxly serrate with low antrorse spines. SCAPE erect, 5 mm in diameter, densely tomentose-lepidote; scape-bracts reduced upward but little changed in shape. INFLORESCENCE laxly compound, tomentose-lepidote, becoming glabrous with age; primary bracts subfoliaceous, all but the highest many times exceeding the globose axillary spikes; floral bracts triangular, recurved, exceeding the flowers, minutely serrate with flat spines. SEPALS free, narrowly triangular, spinose-acuminate, 14 mm long, nerved, the posterior ones alate. PETALS imperfectly known. Pl. I, fig. 23: Section of inflorescence x 1/2; fig. 24: Sepal x 1.

BRAZIL: Minas Gerais: Mun. Itambacuri: Ouro Verde, 9 May 1958, Mendes Magalhaes 19187 (Hb. Bradeanum 17950, type). Mun. Ataleia: In colonies on rock outcrop, Ouro Verde, 8 September 1958, Mendes Magalhaes 12035 (RB 111107).

Plate I

Fig. 1: Tillandsia setacea (Small & Mosier 5506), leaf-section x 25. 2: T. bartramii (LeConte), leaf-section x 25. 6, 7: Greigia rohwederi. 8: Pitcairnia altensteinii var. minor. 9: Puya floccosa var. compacta. 10, 11: Guzmania bicolor. 12-14: Aechmea bahiana. 15, 16: Bromelia eitenorum. 17, 18: Orthophytum amoenum. 19: O. saxicola. 20: O. compactum. 21, 22: O. duartei. 23, 24: O. magalhaesii.

Plate I

ADDITIONAL MATERIALS TOWARD A MONOGRAPH OF THE GENUS CALLICARPA. II

Harold N. Moldenke

CALLICARPA L.

Additional & emended bibliography: Decne., Nouv. Ann. Mus. Hist. Nat. Paris 3: 401. 1835; Sieb., Jaarb. Konink. Nederl. Maatsch. Aanmoed. Tuinbouw [Ann. Hort. Pays-Bas], ser. 3, 1845: 71—72, pl. 5 & 6. 1845; Miq., Prol. Fl. Jap. 30. 1866; Lavallée, Arb. & Arbris. 179. 1877; D. Thompson, The Gardener 1880: 518—519. 1880; Franch., Mém. Soc. Sci. Nat. Cherbourg 24: 240. 1882; H. O. Forbes, Wand. Naturforsch. Malay. Arch. 2: 226. 1886; Gard. Illustr. 24: 633—634. 1903; King & Gamble, Journ. Roy. Asiat. Soc. Bengal 74 (2), extra no., 794 & 802—808. 1908; Nakai, Fl. Kor. 2: 135. 1911; A. H. Graves, Winter Key Woody Pl. 8 & 30. 1913; Gerth van Wijk, Dict. Plantnames 2: 71, 132, 512, & 1534. 1916; Free, Flowers Wint. 41 & 200. 1917; Yabe, Prelim. Rep. Fl. Tsingtau 96. 1919; Nakai, Trees & Shrubs Indig. Jap., ed. 2, 1: 450—464, fig. 213—219. 1927; S. Sasaki, List Pl. Formos. 350. 1928; Van Melle, Journ. N. Y. Bot. Gard. 43: 36 & 42. 1942; T. A. Rao, Bull. Bot. Surv. Ind. 1: 114. 1959; Nath, Bot. Surv. So. Shan States 144. 1960; Legris, Trav. Sect. Scient. Inst. Franç. Pond. 6: 184, 213, 394, 501, 513, & 558. 1963; A. D. Hawkes, Guide Pl. Everglades Nat. Park 43, 45—47, & 49. 1965; Moldenke, Phytologia 13: 401—444. 1966; Anon., Gen. Costa Ric. Phan. 10. 1966; Fournier, Imp. Tree Fam. Costa Ric. 13. 1966; Moldenke, Résumé Suppl. 14: 1 & 3—10. 1966.

The L., Mant. Pl. Alt. 198 (1771) reference given in the bibliography of this genus is sometimes cited as "L., Mant., ed. 2, 198" or as "L., Mant. 2: 198" -- Merrill (1903) and Lam (1919) give the erroneous date "1767" for it. The "Journ. Roy. Asiat. Soc. Bengal 73 (3): 1012 & 1018. 1909" reference sometimes cited is an error for King & Gamble, Mat. Fl. Malay. Penins. 21: 1012—1018 (1909), which is a reprint from Journ. Roy. Asiat. Soc. Bengal 74 (2), extra no., 802—808 (1908). The Decaisne (1835) reference in the bibliography above is sometimes erroneously dated "1865", as, for instance, by Lam (1919), or cited as "5: 401. 1865."

CALLICARPA ACUMINATA H.B.K.

Additional bibliography: Moldenke, Résumé Suppl. 14: 5 & 7. 1966; Moldenke, Phytologia 13: 431—437. 1966.

CALLICARPA ACUTIDENS Schau.

Additional & emended bibliography: Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 23. 1921; Moldenke, Phytologia 13: 437. 1966.

Bakhuizen van den Brink (1921) places this species in the syn-

onyny of what he calls C. cuspidata Roxb. [=C. pedunculata R.Br.].

CALLICARPA ACUTIFOLIA Chang

Additional bibliography: Moldenke, Résumé Suppl. 14: 3. 1966; Moldenke, Phytologia 13: 437--438. 1966.

CALLICARPA AMERICANA L.

Additional & emended bibliography: Bocq., Adansonia 2: 129 (1862) and 3: 192. 1863; Bocq., Rev. Verbenac. 129 & 192. 1863; Gerth van Wijk, Dict. Plantnames 1: 217 (1911) and 2: 132 & 512. 1916; W. H. Harvey, Univ. Ga. Agric. Ext. Serv. Bull. 402, ed. 3, 20 & 31. 1941; F. E. Egler, Check List Ferns & Flow. Pl. Seashore State Park 50. 1942; Moldenke, Known Geogr. Distrib. Verbenac., ed. 1, 3--7, 9--12, 16, 24, 71, 80, & 86. 1942; Moldenke, Alph. List Invalid Names 7, 8, 11, 24, & 27. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 77--80. 1942; Van Dersal, Ornament. Am. Shrubs 50, 259, & 260. 1942; Hottes, Book Shrubs, ed. 4, 168. 1942; Macself, Sanders Encycl. Gard., ed. 21, pr. 4, 71. 1942; R. McVaugh, Ecol. Monog. 13: 130, 135, & 159. 1943; T. G. Yuncker in Lundell, Fl. Texas 3: 139. 1943; J. Drayton, Carol. Flor. 15. 1943; J. H. Davis, Fla. Geol. Surv. Bull. 25: 100 & 170. 1943; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 1. 1943; Betts, Jefferson's Gard. Book 30, 139, 140, & 672. 1944; F. C. Hoehne, Relat. Anual Inst. Bot. S. Paulo 1944: 40. 1944; Murrill, Guide Fla. Pl. 19 & 21. 1945; Roig y Mesa, Plant. Medic. 775. 1945; Moldenke, Phytologia 2: 68, 70, 93, & 124. 1945; Moldenke, Bot. Gaz. 106: 158--160. 1945; Moldenke, Am. Midl. Nat. 32: 575. 1945; Moldenke, Castanea 10: 36 & 37. 1945; Moldenke, Am. Journ. Bot. 32: 609 & 610. 1945; Macself, Sanders Encycl. Gard., ed. 21, pr. 5, 71 (1945) and ed. 21, pr. 6, 71. 1946; Moldenke, Phytologia 2: 154--155. 1946; G. L. Fisher, Am. Bot. Exchange List n.p. 1946; A. C. Martin, Am. Midl. Nat. 36: 608--609, pl. 50. 1946; Moldenke, Alph. List Cit. 1: 3, 4, 6--11, 13--15, 17--20, 22, 23, 25, 27, 29, 30, 32--34, 37, 38, 41, 43, 45--47, 51, 52, 55, 59, 63, 64, 71, 76, 77, 81, 90, 91, 94, 97--101, 104, 107, 112--114, 116, 118, 120, 123--125, 128--130, 137--141, 143, 144, 153, 157--159, 162, 166, 169, 175--177, 181, 183, 186, 190, 192, 193, 195, 197, 199, 200, 202, 203, 205, 207, 209--211, 221, 225, 229, 234, 235, 239, 240, 242, 245--249, 253, 256--262, 265, 267--277, 280, 281, 283, 284, 288, 291--298, 301--314, 316, & 319. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 3 & 4. 1947; Moldenke, Bol. Soc. Venez. Cienc. Nat. 11: 39, 41, 42, & 51. 1947; K. W. Hunt, Am. Midl. Nat. 37: 689 & 747. 1947; Tatnall, Fl. Del. 218. 1947; Moldenke, Phytologia 2: 326, 327, & 346 (1947) and 2: 479. 1948; Moldenke, Wrightia 1: 245. 1948; Moldenke, Castanea 13: 121. 1948; Erickson, Auk 65: 577. 1948; Neal, In Gard. Hawaii, ed. 1, 640. 1948; Moldenke, Alph. List Cit. 2: 327, 333, 335, 337, 340, 343, 354--356, 390, 391, 393--395, 397--401, 403, 405, 407--409, 411, 414--416, 418, 420--429, 432, 434, 435, 437, 438, 443, 447--452, 454, 455, 458, 459, 469, 470, 472, 474, 475, 478, 481, 482, 484, 487, 489--491, 493, 495, 499, 503, 504, 507--509, 512--514, 518--522, 524, 526--528, 530, 536, 543--545, 548--550, 555, 556,

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Recent collectors describe this species as a small or tall handsome shrub, 1—9 feet in height, many-stemmed, with a broad round crown, the stems 3—4 feet long, arched-divergent, simple or with a few long branches, sometimes trailing over other vegetation, the branches whip-like, the leaves soft-green, long-petiolate, usually very coarsely and more or less irregularly toothed (crenate-serrate) along the margins with spreading teeth, usually stellate-tomentose or densely rusty-downy beneath, the petioles 1—3 cm. long or about 1/3 to 1/5 as long as the leaf-blade; peduncles 3—10 mm. long, as long as or shorter than the petiole; calyx-rim subtruncate, 4-apiculate or very shortly triangulate-toothed; corolla varying from bluish or lavender to pale pinkish-lavender, lavender-pink, pink, pinkish, light-pink, pale-pink, pink-purple, pinkish-white, or even white; anthers yellow; fruit small, berry-like, densely crowded on bending branches, varying

from bright-blue or pink to magenta, violet, shining-violet, red-violet, reddish-violet, rose-violet, purple, dark red-purple, cerise-purple, or brilliant wine-purple when mature.

The flowers are described as "pink" on G. J. Goodman 5674, Lundell & Lundell 9653, and G. T. Robbins 2648; "pinkish" on Lundell & Lundell 7048 & 12939 and H. N. Moldenke 296; "light-pink" on G. T. Robbins 2660, Thieret 15945, and Whitehouse 16158; "pale-pink" on Thieret 15934; "pale pinkish-lavender" on Lundell & Lundell 9615; "pinkish-white" on Tharp, Turner, & Johnston 54713; "lavender" on C. L. Lundell 13930; "lavender-pink" on Shinners 20235; "pink-purple" on W. H. Duncan 20155; and "white" on C. H. Mueller 8028.

The leaves are ternate on Cuthbert s.n. [June 13, 1902]. The fruit is referred to as a "berry" by Cronquist, the Lundells, and Whitehouse, but is actually drupaceous. On one sheet of O. E. Jennings s.n. [Fort Meade, late Dec. 1916] in the Carnegie Museum herbarium the fruit looks white when dry -- this sheet may possibly represent var. lactea F. J. Muller. Hottes (1942) calls the flowers "bluish" and the fruits "reddish-violet". Li (1963) describes the "flower and fruit clusters" as "sessile or nearly sessile" in his key, but they are always definitely pedunculate, with the peduncles 3—10 mm. long. He notes that the species is "one of the handsomest Callicarpa in fruit, but it is more tender than the Asiatic species. In its habitat, it is found in rich woods and thickets from Florida to Texas, north to Maryland, Tennessee, Arkansas, and Oklahoma.....The cover illustration is taken from its natural habitat in Virginia. The plant flowers from May to July and bears ripened fruits around October." Santamour (1965) found the chromosome number to be 2n = 36. He concludes, however, that "an accurate appraisal of the cytological situation in Callicarpa will result only from a critical cytotaxonomic study or a large number of species."

Collectors have found the species growing in loose or Carrizo sand, Susquehanna sandy loam, dry fertile ground, sandy clay or loam, and moist or rocky loam, as well as in rich or rocky soil, clay or sandy soil, black swamp soil, moist or moist sandy soil, dry open soil or dry open rocky soil, wet sandy soil, and moist open or open dry sandy soil, in dry sandy places and swampy ground, swamp jungles, woods and rich lowland woods, low open or sandy oak woods, low moist or low moist open woods, shady or low moist flood-plain woods, open or rich mesic woods, cutover pine woods, sandy pine-turkey oak woods, oak-hickory woods and forests, flat pine or upland woods, sandy pine-oak or low maple woods, low or dry sandy woods, rich or rocky woodlands, dry woodlands, forests and mixed forests, maritime and pine forests, swamp and pine-oak-hickory forests, in open places in woods and somewhat marshy places in forests, hammocks and high hammocks, oak hammocks and sandy marl hammocks, pastures and cow pastures, dense sandy woods and live oak woods. It has been found in pinelands, barren pine woods, decidu-

ous forests, thickets, roadside or woodland thickets, sandy pinelands, pine-oak-hickory woods, alluvial woods, swamps and live oak forests, brackish marshes, valleys, salt marshes, swales, creek bottoms, bottomland pastures, roadside ditches, rich river-bottom woods, stream bottom thickets, and sunny rock crevices. It has been observed growing in loose sandy ground in oak woods, at the margins of woodlands, on creek bottoms through rich lowland woods, in pineland on granite, in sandy woodland borders, in the shade of live oak trees, and in dry southern exposure.

Collectors have encountered it along country roads and fencerows, along ricers and small streams, and on stream banks, at the edge of low or moist woods, at the edge of swamps and creeks, in the borders of thick woods, at the edge of swampy or of oak-pine woods, in swamp or woodland borders, at the base of bluffs, close to creeks, among granite boulders, at the edge of woods and thickets, in pond or clay pond margins, at the edges of granite outcrops, among open scrub oak on mountain slopes, in pine-oak woods borders, at the edges of lakes and of upland woods, at the edge of deciduous woodland and of cypress swamps, as well as on wooded river bluffs, stream and creek banks, savannas and pine savannas, low or dry hillsides, mountainsides, wooded slopes and wet slopes, and on granite outcrops. It seems to thrive in gravelly clay pine woods, low rich bottomland, moss and soil mats over rocks, and rich woods, on low or open ridges, foothills and wooded stony slopes, sandy ridges, riverbanks, low hillsides and dry bottoms, the wooded slopes of streams, open dry slopes, and wet limestone outcrops, as well as in blackland prairie soil, floodplain forests, oak-hickory-pine woods, dry oak-hickory woodlands, dry open woodlands, bottomland hardwood-pine forests, openings in pine-oak woodlands, cutover pine and Liquidambar woods, boggy depressions, and low areas in general. It has been seen in woodlands on sand and woodlands on upper river terraces, in mountain ravines, barren pinewoods, oak forests, pine-oak woods, ravines in pinelands, the partial shade of thickets, damp ground, sand in oak-hickory woods, and in thickets at the edge of deciduous woods.

It has been collected in anthesis from April to December and in fruit in every month of the year, growing at altitudes of 50 to 1500 feet. Plée says of it "commune en Virginie et dans la Pennsylvanie"; Demaree calls it "very common" in Montgomery County, Arkansas; Thorne (1954) describes it as "abundant". Ewan says "very abundant all through mixed oak-pine woodland". Riley refers to it as growing in "woods transitional between pine and deciduous forest" in St. Tammany Parish, Louisiana, while Totten, Raynal, Hoffman, & party call it "very abundant" in Alexander County, North Carolina. Goodman found it "frequent in oak forests" in Marshall County, Oklahoma.

Lakela (1964) reports that Callicarpa americana is "occasional" in Pineola Grotto, Citrus County, Florida — the "plants rooted in clefts of rocks". Ray, Lakela, & Patman found it in "dry white sandbank with live oak, longleaf pine, saw palmetto, Quercus geminata & Q. myrtifolia, Carya floridana, Fraxinus, & Pinus clausa"

in Hillsborough County, and Godfrey states that it is "abundant in thickets at edge of deciduous woods" in Leon County of the same state. In Lundell (1942) its Texas distribution is given as follows: "In woods and moist thickets, wet slopes, low rich bottomlands, fencerows, and the edge of swamps, blooming from June to December, eastern and central Texas, from Bowie and Grayson to Orange, Jefferson, & Goliad, west to Bexar, Kendall, & Tarrant Counties." Tharp, Turner, & Johnston found it "in deep loose sandy soil with duff beneath large old stand of Pinus palustris" in Polk County; Warner says "commonest woody plant on sandy loam, deep sand, and sandy clay" in Montgomery County; Whitehouse calls it "adventive" in Tarrant County, and "abundant shrub" in Grayson County, and "one of the most abundant undershrubs in woods east of Dallas to Louisiana border"; Shinners refers to it as "common in open oak woods, rather low sandy ground" in Dallas County; Cory describes it as "frequent in sandy woods" in Jasper County; Ruth calls it "abundant in open dry woods" in Dallas County; and Mueller encountered it "in deep sand amongst live oak, post oak, blackjack, and hickory in creek bottom" in DeWitt County, Texas. L. C. Taylor notes that it is "a favorite food of cardinals, in sunny locations in open woods, also frequent and spectacular along limestone ledges of streams" in Travis County.

Callicarpa americana grows on the coastal plain from Maryland to Florida and Texas, south to western Cuba and Coahuila; also in Bermuda. It is widely cultivated, although not as much so as the Asiatic species, C. dichotoma (Lour.) K. Koch and C. japonica Thunb. Tatnall (1947) records it from Wicomico County, Maryland. Harper (1928) records it from Butler, Chilton, Coffee, Colbert, Covington, Franklin, Greene, Hale, Marengo, Monroe, Morgan, Pickens, Sumter, Talladega, and Washington Counties, Alabama, "and probably all the other counties". He describes it as "A shrub several feet tall, with rough, coarse deciduous leaves, small pink flowers clustered close to the stem, in June and July, followed by small pink-purple berries. Occasionally cultivated for ornament, and said to be hardy as far north as Washington, D. C. No other use seems to be known for it. Grows in dry woods, hammocks, etc., avoiding the richest and poorest soils and the higher mountains. It is usually found in places where fire is rare, but fire is not necessarily fatal to it. The slope of a ravine on the University campus where Callicarpa is abundant was burned over in June, 1921, and the bushes were killed to the ground, but a few weeks later they were sending up new shoots, which reached full height by the end of the season, but apparently bore no flowers or fruit that year. So probably annual fires would exterminate the plant in a few years, and even a fire every other year might discourage it so that it would soon succomb to the competition of other plants which are less sensitive."

Murrill (1945) describes our plant as common in the Gainesville area of Florida, the corolla bluish or pink, and the fruit violet or magenta. J. H. Davis (1943) describes it as a characteristic plant of the Parkwood loamy sand soil of southern Florida. Matsu-

mura (1912) records it as cultivated in Japan. My son and I have seen it in cultivation in the Foster Gardens at Honolulu, Hawaii, in 1961. McVaugh (1943) records it from the shrub layer where the shade is "not too great" with Rhus copallinum. He also gives it as one of the woody species which survives in depressions on rock surfaces "slightly better than in soil areas on the bare rocks" along with Forestiera ligustrina, Gelsemium sempervirens, Quercus georgiana, and Vitis rotundifolia. He describes it as a "common shrub throughout this region, and apparently quite tolerant of soil acidity, as it is one of the chief shrubby invaders of vegetation mats on the flat rocks, where it is associated with Rhus copallinum, and, in the mature stages of the association, with Juniperus virginiana, Vaccinium arboreum, and Pinus taeda. The violet-purple fruit is abundantly produced and very ornamental, and the plant is richly deserving of cultivation on its account."

Van Dersal (1942) comments that Callicarpa americana and Hydrangea quercifolia "which do not occur naturally in the northern part of region 28 [of Mumford's Plant Growth Regions], have long been successfully grown there. Neither of them, however, can be grown in region 27." He describes the beautyberry as follows: "Found in the Southeast is a lovely purple-fruited shrub known locally as French mulberry. The plant is no mulberry and it certainly is not French, hence its proper name now is American beautyberry.....The plant is a well-branched shrub 2 to 6 feet tall, with soft green leaves and bluish flowers produced from June to August. The fruits are small and berry-like, shining violet or red-violet in color, and are carried in clusters along the whip-like branches much like beads on a string. The whole tone of the shrub after the leaves have fallen is a violet or purple from the masses of fruit. The shrub fruits from July to September, depending on the situation, and the fruits may sometimes persist several months. In its native habitat beautyberry grows in rich woodlands, old fields, woods edges, or sometimes in very poor eroded soil. It ranges from Virginia to Missouri south to Texas and Florida, in plant growth regions 17, 20, 25, 28, 29, and 30. It is not hardy in Massachusetts or in England except in the milder parts of that country. Sand, clay, loam, and gravel are acceptable to it, but the richer the soil the better the berries. The shrub is very attractive to birds, 12 species of which are known to feed upon the fruits; they include cardinals, thrushes, bobwhites, mockingbirds and towhees."

Steyermark (1953) gives a very interesting account of the botanical history of this plant in Missouri: "The French Mulberry or Beauty-berry....., one of the most beautiful of native American shrubs, had never been found in a wild state in Missouri. E. J. Palmer, Bush, Letterman, Eggert, and Kellogg were well acquainted with it in Arkansas, where they had collected it from various localities, many of them near the Arkansas-Missouri border, but, although they looked for it in adjacent southern Missouri, none succeeded in locating a Missouri station. Reports of its occurrence

in the state crept into the literature; for example, it was reported in Tracy's Catalogue of the Missouri plants in 1886 on p. 66 from Miller County as collected by Winick, but these reports proved to be based upon misidentifications. In Dr. Moldenke's Monograph.....the Missouri records are likewise shown to be based upon unauthenticated reports.

"At the New York Botanical Garden in the spring of 1949 I conferred with Dr. H. N. Moldenke about the distribution of the Verbenaceae in Missouri, and was surprised to learn that he had examined a specimen of Callicarpa americana supposedly collected in Chariton County, Missouri, by Mrs. Henry S. Young of the Carnegie Museum. She had collected the plant on June 30, 1925. My immediate reaction was that there must be some mistake, since Chariton County is in glaciated north-central territory and not the sort of terrain for Callicarpa. If it occurred anywhere in the state, it should have been found in extreme southern Missouri in an unglaciated section.

"That same spring, I wrote Mrs. Young and expressed my interest in learning the exact station where she had collected the plant, at the same time expressing the possibility of a mistaken locality. I was gratified to hear from her as follows: 'I am so sorry to cause all this trouble about the Callicarpa americana. I am normally a very careful worker and I had a large collection of Chariton Co., Mo., also of Logan Co., Ark. In working these over -- with both places in my mind — I simply wrote the one state when it should have been the other. I take great pride in seldom making a mistake. But this was a bad one. So sorry!' As of the summer of 1949, then, Callicarpa americana was yet unknown to occur in a wild state in Missouri.....

"It was while botanizing on September 29, 1949, along a stretch of White River in Taney County by the Missouri-Arkansas line, just within Missouri territory, that I made a real discovery. From a place on the White River known as Brown's Ferry I was walking downstream north and east towards Cedar Hol along the rocky, limestone, wooded slopes that faced to the south into Arkansas. That afternoon I had not found anything especially exciting; then suddenly I spotted some clusters of small fruits of an unusual shade of purple (between a doge purple [color 732, p. 96, vol. 1. 1938] and beetroot purple [color 830/2, p. 173, vol. 2. 1939] according to the colour chart of the Royal Horticultural Society). Nearing the fruits and examining them, I recognized at once that they were indeed those pf the long hunted Callicarpa. Not one bush, but many were encountered in a small area on the wooded slopes from twenty to twenty-five feet above the surface of the river. Careful search revealed a rather frequent occurrence of the plant scattered up the rocky slopes to the lowest line of limestone bluffs, the highest point reached being 60 feet above the water level of the river.

"I collected many duplicate specimens for distribution to various herbaria and was pleased to realize that here was a new northwestern limit of distribution for this shrub. At the same time,

however, my pleasure in seeing this remarkably beautiful shrub was dispelled by the thought that it would not be long before these plants and the species, at the only known station in the state, would become exterminated. For, although the altitudinal distribution of Callicarpa was found as high as sixty feet above the present water level, the future impoundment of the Bull Shoals dam would not only completely cover this sixty feet, but fifty to sixty additional vertical feet. This would bring the level of the impounding waters well up on the high south-facing limestone bluffs that towered far above the last upper stand of Callicarpa bushes.

"On May 5, 1951, I re-visited this spot and found the plants only after a difficult search, because the new stems were rising from the ground surface rather than growing out from the old wood. During the latter part of October the waters of Bull Shoal dam began to rise on the White River and its various tributaries. Shore-lines were becoming permanently flooded. Trees and shrubs representing many species were being cleared along all the slopes from the old level of the streams to the upper new level of the impounded water and were being cut down ruthlessly and burned. An inferno of flames and smoke passed over the southwestern Ozarks, and with them the first and only stand of Callicarpa discovered in Missouri faded into oblivion."

The same author (1963) says "The only station known in Missouri.....has now been exterminated by the impounded waters of Table Rock Dam.....It is a tragedy.....In the University of Illinois Herbarium appears a specimen of this labelled 'Oxybaphus albidus, Jackson County, May 29, 1884', collected by Bush. The label is from a Mo. State University sheet (no. 17619) and obviously is a mixed label."

It should be recorded here that Smith & Stewart S.103 and Radford & Stewart S.103, cited below from cultivation, were grown from seeds obtained in Cumberland County, North Carolina, while Radford & Stewart S.56 is from seed collected in Alexander County of the same state.

The specific name of our plant is very often upper-cased, a practice now frowned upon by followers of the present edition of the International Rules of Botanical Nomenclature.

Under Genus 136, Callicarpa, in the Linnean Herbarium in London, specimen number 1 is inscribed "americana" in Linnaeus' own handwriting and "=vera" also in his hand, and bears a label of Gronovius. Linnaeus (1753, 1762) gives Burchardia Duham., Johnsonia Mill., and Sphondylococcus Mitch. as synonyms of Callicarpa americana, but these names are more properly regarded as generic synonyms and are so listed by me in the present work.

It should be noted that the C. americana of Blanco, mentioned in the synonymy above, is actually a synonym of C. formosana Rolfe, C. americana Hort. is C. longifolia Lam., C. americana Lour. is C. candicans (Burm. f.) Hochr., and C. americana Sessé & Moc. is C. pringlei Briq. [not C. acuminata H.B.K. as erroneously stated by me

in my 1936 work, unless one does not wish to recognize the validity of C. pringlei as a distinct taxon].

Sprengel (1825) and Schultes (1827) place Callicarpa globiflora Ruíz & Pav. in the synonymy of C. americana L., but it actually is a synonym of Aegiphila integrifolia (Jacq.) Jacks. Because of this faulty synonymy, Sprengel gives the distribution of C. americana as "Carolina. Virginia. Amer. austr." Martin (1946) discusses the endosperm morphology.

The sheet of W. C. Coker s.n. [Arboretum, October 21, 1944] has a label inscribed "White-berried form and purple-berried form from the same root", but the specimen comprises just two tips of branches, the berries on both of which have dried exactly the same as is seen in the normal purple-fruited plant.

Common and vernacular names recorded for our plant are "American beautyberry", "American callicarpa", "americanische Wirbelbeere", "amerikanische Schönbeere", "amerikanische Wirbelbeere", "beauty berry", "beauty-berry", "beautyberry", "beauty-fruit", "Bermuda mulberry", "Bermudian mulberry", "bird-eye", "bunchberry", "burcardie d'Amerique", "callicarpa américaine", "callicarpe d' Amérique", "Carolinian shrubby callicarpa", "commode mulberry", "common American beautyberry", "filigrana", "filigrana de mazorca", "filigrana de piñar", "filigrana fructo morado", "filigrana fruto morado", "filigrana morada", "foxberry", "French berry", "French-lace", "French mulberry", "French-mulberry", "inkberry", "Mexican-mulberry", "purple beauty-berry", "sour-bush", "sourbush", "Spanish-mulberry", "turkey-berry", "turkeyberry", and "Yankee-spice". It should be noted, however, that the name "bunchberry" is also applied more commonly to Chamaepericlymenum canadense (L.) Asch. & Graebn. in the Cornaceae, "foxberry" to Mitchella repens L. in the Rubiaceae and Uva-ursi procumbens Moench in the Vaccinaceae, and "inkberry" to Ilex glabra (L.) A. Gray in the Ilicaceae and Phytolacca americana L. in the Phytolaccaceae.

Sims (1819) reminds us that the common name "mulberry" was originally applied to this and related species because the fruits of C. americana, type species of the genus, are borne so close together in the fruiting cyme as to appear like one compound fruit.

Seymour (1929) records the following fungi as attacking Callicarpa americana: Atractilina callicarpae Dearness & Barthol., Botryosphaeria callicarpae Cke., Cercospora callicarpae Cke., C. pulvimulata Sacc. & Wint., Coniothyrium callicarpae Cke., Diatrype callicarpae B. & Rav., Meliola amphitricha Rav., M. cookeana Sacc. & Speg., M. inermis Kalchbr. & Cke., and Melogramma callicarpae Cke. Westcott (1950) says that it is attacked by black mildew (Meliola cookeana) in Florida and Louisiana and by leafspot (Cercospora callicarpae) from South Carolina to Texas. Brooks (1954) reports that this species is one of the hosts for Radopholus similis in Florida. Coker reports "Infested with soft scale insects belonging to a group closely related to that of cochineal. It is

large, measuring when fresh up to 1 cm. wide and shrinking very little in drying. It has a soft spongy covering, almost white as chalk. The insect itself is full of a deep red thickish liquid, as in the cochineal. Dr. Metcalf of State College did not know the genus or species. The insect was fairly common on French Mulberry here [Bull's Island, South Carolina] and occurred less commonly on Aralia spinosa." Yuncker (1943) tells us that Callicarpa americana is parasitized by Cuscuta coryli Engelm. in Texas.

According to Rehder (1940) Callicarpa americana was introduced into cultivation in 1740, but actually it was first sent to England for cultivation in 1724 [see Bean (1951)]. It was grown both by John Bartram and Thomas Jefferson in their respective gardens. Bailey (1935) avers that it is offered to the horticultural trade now by Howell Nurseries and by Sanford Arboretum in Knoxville, Tennessee, by Katzenstein & Company in Atlanta, Georgia, and by the Sarcoxie Nurseries in Sarcoxie, Missouri. Mattoon (1958) lists eleven horticultural sources.

The physico-chemical properties of the sap in relation to phytogeography are discussed by J. A. Harris (1934). He based his work on specimens collected in the Royal State Park, Florida, as well as in Brickell Hammock and Sykes Hammock, scrub-covered sand dunes of the barrier reef between the ocean and Halifax River at Mosquito Inlet north of Port Orange, and in a mixed community of pine and hardwoods in a deep hammock near Pablo, Saint Johns County, Florida. He also used material from a wooded bluff on the south shore of St. Mary's River about 6 miles above St. Mary's, Georgia, in low flat sandy oak woods 1 1/2 miles north of Fort Oglethorpe, in flat pine-cabbage palmetto woods at the head of navigation on Turtle River, and in moist almost swampy woods at Cabin Bluff Wharf, at the head of the Cumberland River in the same state. His North Carolina material was from higher ground in swamps at South Mills, Camden County, swampy depressions and wooded sand dunes at Swansboro, and the wooded leeward side of sand dunes in Onslow and Brunswick Counties.

Drayton (1943) reports that it "Blossoms in July; grows in dry lands. Said to be useful in dropsical complaints." Rosenthal (1862) also says "Die Blätter sind als Folia Callicarpae gegen Wassersucht gebräuchlich, die Früchte geben rothe Farbe." It is also reported to be useful as a fish-poison. L. A. Taylor (1940) reports that in Alabama it was formerly employed against malarial fever — "The patient is given a sweat bath with the steam from the boiling roots and leaves of the French Mulberry"; that the Choctaw Amerinds use it against dysentery, colic, and dizziness. "The roots are boiled with those of Rubus sp. The patient drinks the decoction to cure dysentery.....A decoction made from the roots and berries is drunk to relieve colic,.....The roots are boiled and the decoction is drunk during the attacks of dizziness." The Koasati Amerinds use it in the treatment of stomach-ache — "A decoction is made by boiling the roots. This is drunk to relieve stomach-ache." She makes the comment that "The sweating of the patient during a fever attack would be beneficial regardless of the plants used."

Mention should be made here of the fact that the Buchoz (1783) illustration is sometimes cited as "pl. 43", but the plate in question is plainly labeled "XXXVI" in the two copies of this work in the library and in the herbarium of the New York Botanical Garden — possibly it is labeled otherwise in other copies. The V. Matthews s.n. [Arboretum, July 10, 1934] specimen bears a notation "drawn for book." Murray (1774, 1784) cites the Linnean Mantissa synonym as page "128", but it was actually published on page 198.

The Buckley s.n. [July, 1820] specimen cited on page 313 of my 1936 work is actually from Wilcox County, Alabama, the G. M. Merrill 21 is from Pope County, Arkansas, and the Gattinger s.n. [east of Cleveland] is from Bradley County, Tennessee — the county names in all these cases having been omitted by the printer when making corrections in the page-proof. The Andrews specimen from "Lyon's View", cited on the same page, is from Knox County, Tennessee. On page 314 the Edwards collection cited from Fort Towson, "Arkansas", is actually from Fort Towson in Choctaw County, Oklahoma. Likewise, the Trelease collection from "Wagner Cove" is in reality from Magnet Cove, Hot Spring County, Arkansas.

Lindheimer 1067 is labeled "Comanche Spring: New Braunfels, etc.", so may actually have been gathered in Comal, Comanche, or some other county of Texas. C. C. Perry s.n. [En route from San Luis Potosi to San Antonio, Texas, August 1878] may have been collected in Mexico or several other Texan counties rather than in Bexar County as here cited. The label of M. Morgan 91 is inscribed "Plants of Florida", but the specimen was collected in Cullman County, Alabama. According to E. J. Alexander, the M. E. Hyams s. n. [Rebel Retreat, June 1879] could have been collected in Iredell or McDowell Counties, North Carolina. The Collector undesignated s.n. [Herb. Iowa State Coll. 108282] is labeled "probably Wichita, Kans.", but this is doubtless an error because the species is not known from that state — its labels appear to have been mixed since one in longhand on the same sheet is inscribed "Caprifoliaceae 457 Symphoricarpos vulgaris".

The Avery, Jefferson, and Weeks Islands, cited below, are in Iberia Parish, Louisiana; Key Largo is in Monroe County, Florida; and Calington Island is in Dare County and Smith Island in Brunswick County, North Carolina.

The C. Hartmann s.n. [Huntsville, Summer 1912] specimen in the University of California herbarium has the collector's surname misspelled "Hartman".

Material of this species has been misidentified and distributed in herbaria under the names C. canna Spreng., C. purpurea Juss., and Maclura aurantiaca Nutt. On the other hand, the Rob. Burton s.n. [October 1946], Radford 4849, and W. H. Rhoades s.n. [North Wales, August 1934], distributed as C. americana, are actually C. dichotoma (Lour.) K. Koch; Chambers s.n. [Monterrey, Mexico] is Buddleia wrightii Robinson in the Loganiaceae; Mrs. H. S. Young s.

n. from Arkansas is Symphoricarpos orbiculatus Moench in the Caprifoliaceae; and Pammel & Pammel s.n. [Miami, Jan. 15, 1928] is Trema floridana Britton in the Ulmaceae.

Hooker (1836) cites T. Drummond 254bis & s.n. [1833] from Louisiana.

In all, 2558 herbarium specimens and 59 mounted photographs and illustrations have been examined by me, including type material of most of the names involved.

Additional & emended citations: MARYLAND: Wicomico Co.: W. M. Canby 724 (W--1323259). VIRGINIA: Elizabeth City Co.: T. W. Chickering s.n. [Fortress Monroe] (F--149574); Churchill s.n. [July 22, 1927] (Vi); G. N. Vasey s.n. [Ft. Monroe] (W--56143). Gloucester Co.: Sargent & Smith s.n. [vicinity of Gloucester] (D--702382). Isle of Wight Co.: A. R. Moldenke 476 (Fg). James City Co.: R. W. Menzel 71 (Mi); Sargent, Thayer, & Smith s.n. [near Williamsburg] (D--702403). Mathews Co.: Rothrock s.n. [Aug. 5, 1879] (E--119321), s.n. [Aug. 10, 1879] (F--322345). Nansemond Co.: Britton, Britton, & Vail s.n. [Suffolk] (F--394771); A. R. Moldenke 477 (Fg). Norfolk Co.: Blanchard s.n. [Dewall's Point] (W--309653); Britton, Britton, & Vail s.n. [July 2d, 1892] (Ca--50624, Cm); Curtiss s.n. [June 27, 1872] (Al), s.n. (F--149781); E. Durand s.n. (F--725399); J. A. Harris C.19334 (F--901598, H--13009); Hubricht B.2559 (Au); M. E. Hyams s.n. [near Sewall's Point, Nov. 7, 1890] (Dt); Kearney 1296 (W--356014), 1498 (W--356192); A. R. Moldenke 479 (Fg); Noyes s.n. [July 10, 1897] (Hp); Rugel s.n. [near Portsmouth] (Ed); A. B. Seymour 16 [91718] (E--981763, Sw, Gg--358636, Lb--16203). Northampton Co.: W. M. Canby s.n. [Eastville, Oct. 1867] (Pa), s.n. [Cape Charles City, Aug. 1894] (Pl--22586), s.n. [eastern shore of Md. & Va.] (F--315218), s.n. (Dt); Canby & Rose 839 (W--297958); Fernald & Long 5426 (Up); Fogg 10033 (Up); H. A. Gleason Jr. s.n. [Sept. 13, 1934] (We); H. G. Richards s.n. [October 27, 1929] (Up); R. R. Tatnall 3014 (Up), 3206 (Up). Princess Anne Co.: Bartram s.n. [Virginia Beach] (D--648998); Bartram & Long s.n. [Sep. 15, 1907] (Up--46744); Bright 1196 (Dm); F. E. Egler 40-269 (N); Fogg 9773 (Up); Harshberger s.n. [Virginia Beach] (W--441487); A. A. Heller 1057 (Ca--36826, E--119297, F--352637, Mm--15349, Pl--22587, Up--17063, W--56144), s.n. [July 12, 1893] (Ed); A. S. Hitchcock s.n. [Virginia Beach, Sept. 4, 1905] (Ur); Hollick & Britton s.n. [Virginia Beach] (W--310788); Kearney 2086 (W--356740); K. K. Mackenzie 1702 (E--119317, Ed); McCallum s.n. [Virginia Beach, 1921] (Cm); Meredith s.n. [Inlet] (D--624476), s.n. [south of Virginia Beach] (D--613543, E--961558); Piper s.n. [Virginia Beach] (W--592946). Southampton Co.: Fernald & Long 6363 (N, Up); Tidestrom 6841 (Ar--10094, W--693896). Surry Co.: A. R. Moldenke 475 (Fg). Warwick Co.: Swinerton s.n. [Newport News] (Mu--

4299). County undetermined: Plée 386 (P). NORTH CAROLINA: Alexander Co.: W. B. Fox 1015 (No—11604); Keever 156 (H—74535), 409 (H—73320); Radford 13867 (Hi—93390); Radford & Stewart 1656 (Au, Hi—22648); Totten, Raynal, Hoffman, & party s.n. [May 21, 1938] (Hi—3252). Anson Co.: Ahles & Leisner 19284 (Hi—93389); S. G. Boyce 1042 (Ni—21038). Beaufort Co.: Blomquist 7962 (H—36087); D. S. Correll 1546 (We); R. K. Godfrey 8454 (Dm); Moore & Woods s.n. [Aug. 1, 1948] (No—13979); Radford 36162 (Hi—105614), 42019 (Hi—105613). Bertie Co.: Ahles & Haesloop 52110 (Hi—106784); D. S. Correll 1973 (H—33129); R. K. Godfrey 6998a (No—8580); A. R. Moldenke 470 (Fg). Bladen Co.: Ahles & Haesloop 29127 (Hi—105610); Biltmore Herb. 1720c (Al, E—119153, Fc, Io—42471, Na—10852, S, Vu, W—332094); F. E. Boynton s.n. [Feb. 1896] (E—119320); A. A. Heller 14041 (Du—157515, E—932538, F—689834, Se—85971). Brunswick Co.: Fox & Wells 501 (No—8577); R. K. Godfrey 6381 (No—8584); Reed & Stites 34 (Dt), 104 (Dt); B. W. Wells s.n. [7/3/1940] (No—8578). Camden Co.: D. S. Correll 2071 (Bt—33196, H—32131); J. A. Harris 17733 (W—904925); A. R. Moldenke 481 (Fg). Carteret Co.: Eyster 265 (Ur); Fox & Whitford 1108 (No—11379); R. Gray s.n. [Shackleford Banks, 6/28/38] (H—50202); B. W. Wells s.n. [6/28/1930] (No—8583). Chatham Co.: Radford 6288 (Hi—59413). Chowan Co.: Ahles & Duke 50922 (Hi—106785); D. S. Correll 2033 (H—32133); A. R. Moldenke 469 (Fg). Columbus Co.: Ahles 475 (Ur); Blomquist & Correll 4899 (H—31648); R. K. Godfrey 6279 (Hi—10563); P. O. Schallert 64, in part (Ur); Wiegand & Manning 2689 (Po—214782). Craven Co.: Radford 37377 (Hi—105609). Cumberland Co.: Radford & Stewart s.n. [Oct. 8, 1939] (Hi—13123). Currituck Co.: Bartley & Pontius 429 (N); F. Blanchard s.n. [Snowden, Nov. 9, '90] (Dt). Dare Co.: F. R. Fosberg 17839 (No—23071); P. O. Schallert 64, in part (B), s. n. [7/10/41] (Au, Ca—882439, Du—369449), s.n. [7/14/41] (N); Radford, Haesloop, & Miller 7553 (Hi—55816). Duplin Co.: Ahles 35720 (Hi—105605). Durham Co.: Blomquist 4703 (H—20441). Edgecomb Co.: Bridgers s.n. [Tarboro, Oct. 1916] (Hi—59414). Franklin Co.: J. S. Holmes s.n. [Sept. 29, '14] (Hi—59405). Gaston Co.: Oosting 1637 (H—42785). Gates Co.: Ahles & Duke 44595 (Hi-106786), 51468 (Hi—106787). Graham Co.: Radford 15910 (Hi—92919). Greene Co.: A. R. Moldenke 465 (Fg); Radford 40343 (Hi—104895). Halifax Co.: Bartram s.n. [Weldon] (D—538223); R. K. Godfrey 5230 (H—47044); H. R. Totten s.n. [Oct. 28, 1934] (Hi—59411). Harnett Co.: Foust & Foust s.n. [6/29/38] (N); Radford 6278 (Hi—54202); Radford & Stewart 630 (Hi—21461). Henderson Co.: Small & Huger s.n. [Chimney Rock to Hendersonville] (F—401309). Hertford Co.: D. S. Correll 2298 (H—32256); Woods &

Moreland BWO.43 (Hi--34131, No--13877). Hoke Co.: Bell 185-552 (Hi--33633). Hyde Co.: Radford 39034 (Hi--104896). Iredell Co.: M. E. Hyams s.n. [Rebel Retreat, June 1879] (Ka). Johnston Co.: Deans s.n. [Selma, Oct. 22, 1937] (Hi--59401); Fox, Whitford, & Campana 1227 (No--12638); B. E. Smith s.n. [Sept. 14, 1932] (Hi--59410). Jones Co.: Beaven 525 (H--32498); Corbin & Wyatt 6-137 (Hi--57633); J. S. Holmes s.n. [Maysville, July 12, 1919] (Hi--59404); McCarthy s.n. [Trent River] (W--787638). Lee Co.: S. Stewart 818 (Hi--106788). Lenoir Co.: D. S. Correll 1424 (E--1111450, H--32257); Radford 28990 (Hi--92905); H. R. Totten s.n. [Aug. 8, 1931] (Hi--59408). Martin Co.: R. K. Godfrey 7028 (H--50271, No--8582); A. R. Moldenke 471 (Fg); Radford 39465 (Hi--104422), 41927 (Hi--104423). Montgomery Co.: Oosting 1858 (H--49628); Radford 19366 (Hi--92924). Nash Co.: Ahles & Leisner 21279 (Hi--93424). New Hanover Co.: MacElwee s.n. [Wilmington] (D--517409); Macfarlane s.n. [June 16--22, 1894] (Up--36437), s. n. [June 26, 1908] (Up--39738); Macfarlane & Davis s.n. [June 18, 1894] (Up); Uhler 68 (W--1467250); Wells & Shunk s.n. [May 14, 1937] (No--8579). Northampton Co.: Ahles & Haesloop 52388 (Hi--106789). Onslow Co.: R. K. Godfrey 6396 (H--55388, Hi--10493), 6455 (Hi--10327); J. A. Harris C.19570 (Pl--84073); C. E. Wood 6463 (Hi--51185). Orange Co.: T. Brown s.n. [Oct. 18, 1948] (Hi--35042). Pamlico Co.: Davis & Davis 10510 (We); Godfrey & White 6801 (Fl--12343, No--8581); Oosting 33212 (H--17907); Radford 35827 (Hi--104544). Pasquotank Co.: Ahles & Duke 48078 (Hi--104418, Hi--104419); D. S. Correll 2097 (H--32132); A. R. Moldenke 472 (Fg). Pender Co.: Ahles 36182 (Hi--104565); M. E. Hyams s.n. [Burgaw, July 1880] (Dt, Dt, Po--85770), s.n. [Bengaw] (E--119186, W--147596). Perquimans Co.: A. R. Moldenke 467 (Fg). Polk Co.: E. C. Townsend s.n. [Chimney Rock, July 16, 1897] (Pl--86885). Richmond Co.: Radford 14482 (Hi--92926). Robeson Co.: Ahles 37281 (Hi--104543). Rowan Co.: Biltmore Herb. 1720e (B, Bg, Dr, F--806890, Na--10867, Vu, Vu, W--332095); A. A. Heller 140 [June 28] (E--119298, F--313137), 140 [Aug. 21] (Ca--25094, Ca--25095, E--119299, Ed, F--396189, Up--17065, Up--17066); J. B. Horton 557 (Hi--93425); J. K. Small s.n. [Dunn's Mtn.] (F--179893). Rutherford Co.: Biltmore Herb. 1720d [July 22] (Go, Lu, S); C. H. Hall s.n. [Shaking Bald Mt.] (Vt); Rugel s.n. [inter Asheville et Rutherfordtown, Aug. 1842] (Ed, Go); E. C. Townsend s.n. [Chimney Rock] (W--341524). Sampson Co.: Ahles & Haesloop 29966 (Hi--104542). Scotland Co.: Ahles & Haesloop 28699 (Hi--104541); R. K. Godfrey 5066 (H--47033). Stanly Co.: Ahles & Radford 11933 (Hi--92927). Tyrrell Co.: D. S. Correll 1899 (H--32134, N). Wake Co.: Blomquist & Correll 2514 (H--32362); Buell & Godfrey 1713 (H--

68253), s.n. [9-30-1937] (No—8585); Coker & Totten s.n. [April 9, 1932] (Hi—59403), s.n. [5/29/1932] (Hi—59409); Radford 8220 (Hi—57275); H. R. Totten s.n. [July 24, 1916] (Hi—11093, Hi—59415). Washington Co.: Radford 38767 (Hi—104540). Wayne Co.: Blomquist & Correll 4796 (H—31652); Buckley s.n. [June 22, 1849] (Ca—379992); W. B. Fox 4945 (Ur); Radford 25449 (Hi—93428). Wilson Co.: J. F. Matthews 105 (Hi—106790). Calington Island: Paris & Daniel s.n. [10/31/54] (Hi—58139). Roanoke Island: Radford & Stewart 826 (Hi—15067, Ur). Smith Island: Blomquist s.n. [Sept. 3, '32] (Ob—68638); Fox & Wells 501 (Ca—743928); J. A. Harris C.19591 (F—901618); A. C. Mathews s.n. [May 1, 1935] (Hi—5856); W. Palmer s.n. (W—312354). County undetermined: Ashe s. n. [eastern N. C.] (E—119327), s.n. [southeastern N. C.] (E—119328, W—327648); Collector undesignated s.n. [October 19, 1897] (S), s.n. [26 Oct. 1897] (S); M. A. Curtis s.n. [1842] (E—119308); M. G. McCarthy s.n. [July 1885] (W—147599), s.n. [Oriente Carolina, Sept., Julii 1885] (Hi—59406), s.n. [eastern N. C.] (Ed, F—349111, W—227156). SOUTH CAROLINA: Abbeville Co.: Radford 25956 (Hi—93388). Aiken Co.: Radford 543 (Hi—16750). Allendale Co.: Ahles & Bell 15874 (Hi—93391); A. R. Moldenke 420 (Fg). Anderson Co.: W. H. Davis 9372 (E—899622); H. R. Totten s.n. [6-29-1935] (Hi—59416). Bamberg Co.: Ahles & Haesloop 30571 (Hi—105611). Barnwell Co.: A. R. Moldenke 424 (Fg). Beaufort Co.: Ahles & Bell 15551 (Hi—93398); C. P. Alexander 258 (W—910455); C. R. Bell 4789 (Hi—92921). Berkeley Co.: Ahles 35503 (Hi—105612); J. C. Barber s.n. [Aug. 21, 1949] (N); Revenel 3712 (Ed). Calhoun Co.: Ahles 35252 (Hi—105607); Ahles & Haesloop 30187 (Hi—105606). Charleston Co.: Harshberger s.n. [August 8, 1911] (Up—63344); K. W. Hunt 269e (It), 2691 (Hi—27624); Stewart s.n. [near Charleston] (F—115750). Cherokee Co.: Ahles 34395 (Hi—105608). Chesterfield Co.: Radford 15726 (Hi—92922). Clarendon Co.: Radford 24487 (Hi—93392). Colleton Co.: C. R. Bell 3622 (St). Darlington Co.: M. A. Curtis s.n. [Society Hill, June 1852] (Pa); J. B. Norton s.n. [July 8, 1920] (Hi—59396); B. E. Smith 372 (Hi—26487), 1304 [June 1940] (Hi—26486), 1304 [Aug. 3, 1940] (Hi—26486), 1456 (Hi—26484), s.n. [Hertsville, 10/20/31] (Hi—59392). Dillon Co.: Ahles 37160 (S); Ahles & Haesloop 27826 (Hi—104894); A. R. Moldenke 451 (Fg). Dorchester Co.: Ahles & Haesloop 37809 (Hi—121516). Edgefield Co.: Radford 26394 (Hi—93393). Fairfield Co.: C. R. Bell 9452 (Hi—93394); House 2474 (W—5141145). Florence Co.: C. R. Bell 13378 (Hi—121517); Wiegand & Manning 2690 (Po—214783). Georgetown Co.: D. S. Correll 5292 (H—42513); Godfrey & Tryon 126 (Ca—956875, Gg—290707, H—58063, It, N). Greenville Co.: O. M. Freeman 57521 (Hi—93416); Thomason 61 (Gg—310909);

Wherry s.n. [September 20, 1934] (Up). Greenwood Co.: W. H. Davis 9128 (E--898877); Radford 26737 (Hi--93415). Hampton Co.: C. R. Bell 3913 (Hi--92920). Horry Co.: Coker & Totten s.n. [July 13, '32] (Hi--59399); A. R. Moldenke 456 (Fg). Jasper Co.: Ahles & Bell 15664 (Hi--93418). Kershaw Co.: Britt 841 (Hi--177880). Lancaster Co.: Ahles & Haesloop 27457 (Hi--104425); Huntley 139 (H--54983). Laurens Co.: C. R. Bell 10277 (Hi--93421); O. M. Freeman 56496 (Hi--92923). Lee Co.: A. R. Moldenke 438 (Fg); Radford 27319 (Hi--93420). Lexington Co.: Hexamer 364 (Us), s.n. [Lexington, 14 June 1855] (Br); Hexamer & Maier s.n. [June 14, '55] (Cm); E. A. McGregor 208 (Du--75709), s.n. [vicinity of Batesburg] (W--982620); Radford 27152 (Hi--93419). Marion Co.: C. R. Bell 13661 (Hi--121518); A. R. Moldenke 459 (Fg). Marlboro Co.: Radford 19030 (Hi--92925). McCormick Co.: Radford 26218 (Hi--93422), 39828 (Hi--104424). Newberry Co.: C. R. Bell 9191 (Hi--93423). Oconee Co.: A. P. Anderson 1455 (Io--17437), s.n. [Walhalla, October 1897] (Io--21409). Orangeburg Co.: Ahles & Leisner 31545 (Hi--104421); A. R. Moldenke 460 (Fg). Pickens Co.: Bannister & Anderson 575 (Hi--104420). Richland Co.: C. R. Bell 16400 (Hi--180054); Crawford s.n. [Columbia] (F--218957); Seeman s.n. [Columbia, Oct. 1932] (H--5421); K. A. Taylor 91 (Ur), s.n. [Columbia, June '91] (Dt). Saluda Co.: Radford 26853 (Hi--93427). Sampson Co.: A. R. Moldenke 464 (Fg). Sumter Co.: Radford 27522 (Hi--93426). Union Co.: O. M. Freeman 56667 (Hi--92928). Williamsburg Co.: Radford 24644 (Hi--93396). York Co.: Ahles 34645 (Hi--104539); Ahles & Haesloop 31128 (Hi--104538). Bull's Island: W. C. Coker s.n. [Christmas 1945] (Hi--28149). Isle of Palms: T. G. Harbison 12 (Hi--8418). Pawley's Island: Radford 24915 (Hi--93417). St. Helena Island: Cuthbert s.n. [June 13, 1902] (Fl--20934). Sull Island: W. Palmer s.n. (W--513617). Witherspoon Island: B. E. Smith 1454 (Hi--26485). County undetermined: Curtiss s.n. [S. C., 1852] (Us); J. A. Harris C.19701 (W--1435755). GEORGIA: Bacon Co.: A. R. Moldenke 343 (Fg). Baldwin Co.: H. N. Moldenke 23037 (Ac). Bibb Co.: Mattams s.n. [Macon] (Pa); A. R. Moldenke 368 (Fg); W. H. Rhoades s.n. [near Macon] (Hs). Bleckley Co.: A. R. Moldenke 375 (Fg). Brooks Co.: A. R. Moldenke 311 (Fg). Burke Co.: A. R. Moldenke 408 (Fg). Charlton Co.: Strausbaugh & Core s.n. [June 5, 1954] (We). Chatham Co.: Crawford s.n. [Thunderbolt] (D--602443); Miller & Maguire 1252 (Ua--16568); Oemler s. n. [1837] (Lu). Chattooga Co.: Freeman & Freeman s.n. [Blowing Spring near Chelsea, June 9, 1921] (Ar--19782). Clarke Co.: J. H. Miller 106 (F--556659), E.1034 (Up). Clayton Co.: E. B. Travis s.n. [Riverdale, 10-8-30] (Ga). Colquitt Co.: Kirkpatrick s.n. [Doerun, 8-14-30] (Ga). Columbia Co.: Pyron & McVaugh 1043 (Up). Dade Co.:

Graves 1054 (E—975490). Decatur Co.: A. R. Moldenke 295 (Fg). DeKalb Co.: Alexander, Everett, & Pearson s.n. [Stone Mtn., Oct. 1, 1933] (N); W. M. Canby 487 (W—1323260), 6457 (E—119185), s. n. [Stone Mtn.] (F—351669); D. S. Correll 6579 (H—55781); J. Davis 2121 (Au), 5689 (Au); Eggert s.n. [Little Stone Mtn.] (E—119165); R. M. Harper 187 (E—119149, Ed, F—140636, W—384819); McVaugh & Pyron 373 (O); F. W. Pennell 4027 (Up—62323); Pyron & McVaugh E.7480 (Up); J. K. Small s.n. [base of Little Stone Mtn.] (F—180766, W—56140); J. D. Smith s.n. [Stone Mtn.] (W—1323257); Whitaker 101 (Ca—882440); Wurdack s.n. [Stone Mtn., 9-26-13] (Cm). Dodge Co.: A. R. Moldenke 385 (Fg). Dougherty Co.: J. M. Gillespie s.n. [Oct. 6, 1925] (Du—153267). Floyd Co.: M. G. Mc Carthy s.n. [Rome] (Na—2223). Fulton Co.: P. O. Schallert 64, in part (S). Glynn Co.: Pyron & McVaugh E.7478 (Up); Van Halfern s.n. [Brunswick, 6-23-27] (Ga, Ga). Grady Co.: A. R. Moldenke 304 (Fg, S). Jasper Co.: Porter s.n. [Monticello, 1846] (Pr). Jeff Davis Co.: A. R. Moldenke 352 (Fg). Jefferson Co.: A. R. Moldenke 403 (Fg). Liberty Co.: Grimm s.n. [6-27-43] (Cm). Lowndes Co.: Quarterman 1266 (Va). McDuffie Co.: H. H. Bartlett 950 (Dm, Po—64818, Ur). McIntosh Co.: D. S. Correll 5442 (No—18320, We); H. H. Smith 2256 (F—247902, Ol). Miller Co.: Duncan & Hatcher 1707 (Ky). Monroe Co.: A. R. Moldenke 382 (Fg). Newton Co.: Dunham s.n. [Nov. 2, 1928] (F—861059). Oglethorpe Co.: Duncan 1426 (Bt—58291). Rabun Co.: Coken, Totten, & Harbison s.n. [Aug. 29, 1932] (Hi—59397, Hi—59398). Richmond Co.: Cuthbert s.n. [July 15, 1899] (Fl—20935), s.n. [July 20, 1899] (Fl—20932), s.n. [July 17, 1904] (Fl—20933). Rockdale Co.: Cronquist 4850 (Ca—789000, N, Tl), 5323 (N, Tl). Screven Co.: Ahles 54329 (Hi—201966); Boole 988 (Hi—183817); A. R. Moldenke 425 (Fg). Telfair Co.: A. R. Moldenke 360 (Fg). Thomas Co.: A. R. Moldenke 313 (Fg); Mrs. A. P. Taylor s.n. [Thomasville, June 12, 1903] (Oa), s.n. [Thomasville, Aug. 28, 1903] (Oa), s.n. [Thomasville] (Oa). Twiggs Co.: A. R. Moldenke 384 (Fg). Walker Co.: Ruth 229 (Ed, Ed). Washington Co.: A. R. Moldenke 399 (Fg). Wayne Co.: W. H. Duncan 7655 (Ca—771503, No—13894). Sapelo Island: W. H. Duncan 20155 (Hi—106314, Lb—42769). Tybee Island: Grosvenor s.n. (F—33316). County undetermined: Feay s.n. (Pa); J. A. Harris C.19847 [Turtle River] (Ca—610125); Keen & Keen s.n. [s. Ga.] (Pa). FLORIDA: Alachua Co.: Arnold s.n. [6/14/31] (Fl—20938); Collector undesignated s.n. (Io—127901); Gillman s.n. [Waldo] (F—150534); Kea s.n. [5/6/33] (Fl—20937); Loucks & West s.n. [Gainesville, 6-27] (Fl—20940); C. D. Mell s.n. [Gainesville, Dec. 23, 1906] (W—1584898); Stuhr s.n. [Gainesville, Nov. 1925] (Or—33128); A. D. Welch s.n. [Gainesville, April 19, 1927] (Io—127331). Bradford Co.: West &

Arnold s.n. [Hampton, 15 May 1940] (Fl--32357). Brevard Co.: A. A. Baldwin 13 (D--504178, Up--17067), 42 (Up--17064); Collector undesignated 226 (Gg--208927); P. O. Schallert 64, in part (Ur). Calhoun Co.: A. R. Moldenke 273 (Fg). Clay Co.: E. L. Braun s.n. [Green Cove Springs] (Cn). Collier Co.: C. C. Deam 65825 (No--21187); Muenscher & Muenscher 11211 (N); Scrull s.n. [Naples, 5/25/37] (Fl--27476). Columbia Co.: A. S. Hitchcock s.n. [Lake City] (F--234221); McCulloch 40 (Fl--209411, W--440438), s.n. [Lake City, June 17, 1901] (Ar--7506, Io--107150); Rolfs 183 (Ga, Ga, Ur), s.n. [Lake City, 9-17-93] (Ga). Dade Co.: Bowman s.n. [Miami, Aug. 1916] (H--26376, Up--70511); Buswell s.n. [July 22, 1936] (Bu); Cooper s.n. [Ft. Dallas, April 1859] (Ms); H. C. Cowles 24-8 [188] (Bt--39883, Ob), s.n. [Miami, Apr. '04] (Ur); Cratty s.n. [Miami, Jan. 29, 1933] (Io--140216); Duckett s.n. [Brickell Hammock] (W--1485633); Elder 323 (H--73168); A. P. Garber s.n. [Miami, June 1877] (Pa, Vt), s.n. [Miami] (D--569668, E--119278); Harshberger s.n. [August 15, 1911] (Up--63208), s.n. [December 1911] (Up--63380); Hawkins s.n. [1-25-28] (Fl--20939); A. S. Hitchcock s.n. [Miami, June--July 1898] (F--231737); Howell 872 (W--893578); Janish & Janish 552 (Du--392749); Macfarlane's party s.n. [Dec. 1901] (Up, Up); B. McAllister 92 (H--41471); Meredith s.n. [Miami] (D--624967); H. N. Moldenke 296 (Go, S, Up, Ur), 3728 (N); Mosier & Safford 303 (Ar--19781); Edw. Palmer 402 (E--119184); Safford s.n. [Simpson's Hammock] (W--1116874); Safford & Mosier 21 (W--1035857), 303 (W--1036142); J. K. Small 7324 (N), 7376 (N); Small & Carter 91 (D--570941), 651 (D--569957); Tidestrom 6959 (Ar--6959, Ar--10065, Ca--882445, H--67898, Mi--photo, W--751531). DeSoto Co.: Harshberger s.n. [June 3, 1912] (Up--63010), s.n. [Ft. Ogden] (D--560758); E. West s.n. [Lacy, 23 Sept. 1938] (Fl--153). Duval Co.: Curtiss 1971 [fls., June] (Mi, Mn, Mu--1648, Or--8840, P, Vi), 1971 [frs., Sept.] (Ca--25093, D--550100, E--119192, E--119305, F--148426, Mi, Mn--15350, Mu--1648, Or--8840, P, Vi, Vt), 4387 (Ca--58611, Du--90914, E--766880, W--218281), 4925 [fls., June 6] (Al, Ca--104990, Ed, F--147392, Io--38764, Mn--15353, W--224494), 4925 [frs.] (Mn--15323), 6189 [June 12, 1898] (Fl--20942, Hi--59394, Ur, Vt, Vu), 6189 [Aug. 30, 1898] (Fl--20942, Hi--59394, Ur, Vt, Vu); Fredholm 144 (Po--85766), 5294 (E--818111, W--717178); A. S. Hitchcock s.n. [Jacksonville] (F--231890); Keeler s.n. [vicinity of Mayport and Jacksonville] (Ol); Lighthipe 405 (Ob--50623), s.n. [South Jacksonville, June 17, '97] (Hi--59393), s.n. [South Jacksonville, Sept. 15, '97] (Hi--59393). Escambia Co.: Brinker 12 (I). Flagler Co.: West & Arnold s.n. [Flagler Beach, 18 Apr. 1940] (Fl--19257), s.n. [Andalusia, 10/10/40] (Fl--32844). Franklin Co.: Biltmore Herb. 1720b (Vu, W--332093), 1720f (E--119154, E--119155, W--335089); A. W. Chapman 40

(E--119173, E--119174), s.n. (E--119233, W--56142); Herb. Chapman 5980 (E--119310); McAtee 1764 (W--514798); Saurman 624 (W--1323258), 6459 (E--119183), s.n. [Apalachicola, 1867] (Pa), s.n. [Apalachicola] (Up--17062). Gadsden Co.: H. Foster 11 (Fl--20931). Glades Co.: Lovett 201 (H--38644). Hamilton Co.: West & Arnold s.n. [White Springs, 11 Apr. 1940] (Fl--32027). Hernando Co.: R. N. Jones s.n. [vicinity of Brooksville] (W--1086820). Highlands Co.: Hunnewell 10483 (Ua--36989). Hillsborough Co.: F. S. Blanton 6662 (Du--201148, En, H--22121, Hi--59400, Po--220816, S); S. M. Deam 2738 (Dm, Ok, Po--267684); A. P. Garber s.n. [Tampa] (F--139684, Us, W--265077); Ray, Lakela, & Patman 10133 (Hi--201400). Jefferson Co.: Herb. Exploration Party 1939 s.n. [Wacissa, 16 Mar. 1939] (Fl--30168); A. S. Hitchcock s.n. [June-July 1898] (E--119181, F--234220). Lake Co.: A. S. Hitchcock s.n. [vicinity of Eustis, June & July 1894] (Ka), s.n. [Eustis, 1894] (Fl--20944), s.n. [Eustis] (E--119234, F--233197); Nash 725 (Ca--104989, E--119236, Ed, F--38416, Mm--15352, Vu, W--228226), 2145 (W--252136, W--309640). Lee Co.: A. S. Hitchcock 272 (E--119144, F--101341, W--387306), s.n. [Myers, July--Aug. 1900] (Ka); C. Skottsberg s.n. [Fort Myers, 20.5.1935] (Go); J. P. Standley 492 (E--819012, F--473957, Po--174969, Ur, W--910889). Leon Co.: R. K. Godfrey 53359 (Hi--193406, N). Levy Co.: A. P. Garber s.n. [Nov. 1877] (Io, Vt); Janish & Janish 339 (Du--392743, N). Liberty Co.: West & Arnold s.n. [Torreya State Park, 22 July '40] (Fl--32355). Manatee Co.: J. H. Simpson 40 (D--526671, F--231129, Gg--163107, W--334922, W--334934); S. M. Tracy 7531 (Up--50863), 7534 (Ca--181892, Cm, E--119143, E--119324, E--119325, E--119326, Ed, F--120855, Io--48621, S, Tr, W--442191). Monroe Co.: A. D. Welch 1548 (Dp). Nassau Co.: A. S. Hitchcock s.n. [Fernandina] (E--119131). Orange Co.: Barrows s.n. [Winter Park, 1894] (Dt); Mac Elwee s.n. [Sanford] (D--517410); Pieters 405 (W--511659); Vesterlund s.n. [June 1889] (Us, Us, Us). Osceola Co.: Mearns 6 (W--391101); Singletary 151 (H--45917). Palm Beach Co.: G. L. Bates s.n. [Jupiter, 1889] (Fc--7573), s.n. [Jupiter] (W--561141); W. B. Fox s.n. [April 14, 1945] (We); A. S. Hitchcock 1489 (F--233566); E. West s.n. [Lake Worth, 6 Sept. 1939] (Fl--30748). Pasco Co.: Arnold s.n. [New Port Richey, 23 Sept. 1939] (Fl--31073); Carpenter s.n. [New Port Richey, October 22, 1936] (Vt); O'Neill s.n. [St. Leo] (E--953153). Pinellas Co.: S. M. Deam 1958 (W--513446); Tidestrom 7014 (W--751546); M. H. Williams s.n. [Pinellas Point] (D--636973). Polk Co.: O. E. Jennings s.n. [Fort Meade, late Dec. 1916] (Cm, Cm, Cm); Jennings, Jennings, & Jennings s.n. [Dec. 27, 1916] (Cm); McFarlin 3020 (Mi), 5573 (Mi); Ohlinger 185 (E--119152, F--230469, Fl--20943, Ga, Ur), s.n. [May 17, 1894] (Ga); J. D. Smith s.n. [Peace Creek] (W--1323261). Putnam Co.: West &

Arnold s.n. [East Palatka, 7 June 1940] (Fl--32351). Saint Johns Co.: L. C. Reynolds 311 (W--1323263); M. C. Reynolds s.n. [Dry sandy places] (Pr), s.n. (Up--17068); J. D. Smith 423 (W--1323262); West & Arnold s.n. [Crescent Beach, 7 June 1940] (Fl--32356). Saint Lucie Co.: A. C. Beal s.n. [Camp Walton, Jan. 1925] (Ur); H. N. Moldenke 21492 (Z). Seminole Co.: D. S. Correll 6367 (H--55787); P. O. Schallert 64, in part (B, B, Hi--54927, Ok, S, S). Suwannee Co.: Herb. Exploration Party 1939 s.n. [Ichtucknee Springs, 17 Mar. 1939] (Fl--30167). Volusia Co.: H. C. Beardslee 81 (Ob--97271); Hood s.n. [Orange City] (E--850163); B. H. Patterson s.n. [Nov. 27, '17] (Cm), s.n. [Nov. 26, 1919] (Cm). Walton Co.: Ashe s.n. [Mossyhead, 7/31/26] (Hi); E. G. Hume s.n. [6/2/38] (Fl--12358); Tyson 642 (Ur). Key Largo: M. Bush s.n. [Key Largo, Feb. 29, 1936] (Cm); Janish & Janish 495 [Key Largo] (Du--392747); H. R. Totten s.n. [December 28, 1940] (Hi--22705). County undetermined: G. H. Bates s.n. [1889] (Bl--42206, Ka, W--56141); A. W. Chapman 4 [South Florida] (E--119319), s.n. [Florida] (Gg--31966, Ok); Collector undesignated s.n. (Ky); Curtiss s.n. [1875] (F--34827, F--259936, F--259980); Torrey & Gray s.n. (Us). ALABAMA: Baldwin Co.: Demaree 35926 (St). Blount Co.: Eggert s.n. [Blount Springs] (E--119164); J. D. Smith 153 (W--1323256). Cherokee Co.: G. F. Freeman s.n. [Lookout Mtn., July 14, 1905] (Ka--67033). Cullman Co.: M. Morgan 91 (I). Elmore Co.: Koepper & Justice s.n. [near Millbrook, June 20, 1943] (Dp--38370). Etowah Co.: Eggert s.n. [Blaikireek Falls] (E--119163); G. N. Vasey s.n. [Gadsden, 1878] (Pr, Vt). Jackson Co.: A. R. Moldenke 774 (S). Jefferson Co.: A. S. Hitchcock s.n. [Birmingham] (F--234792). Lawrence Co.: A. R. Moldenke 767 (S). Lee Co.: C. F. Baker 8433 (E--119176), s.n. [Auburn, 9-20-96] (Po--64809); H. R. Baker s.n. [Auburn, 21 August 1929] (H--107723); Earle & Baker s.n. [Auburn, 7/6/1897] (E--119177, Ka, Ur), s.n. [7-16-1897] (Ob--50622), s.n. [Auburn, 9/20/1897] (Ka); L. H. Pammel s.n. [Auburn, June 3, 1921] (Io--10204); Pollard & Maxon 12 (W--442714). Madison Co.: Howell 505 (W--499630); W. H. Rhoades s.n. [near New Hope] (Hs); Shimek s.n. [Huntsville] (E--119175, F--78727). Marshall Co.: A. R. Moldenke 772 (S). Mobile Co.: Graves 649 (W--1085022); C. T. Mohr s.n. [Mobile, July] (Du--90915), s.n. [Mobile] (W--771910); F. H. Sargent s.n. [June 18, 1950] (Ok). Montgomery Co.: Koepper & Justice s.n. [near Montgomery, June 27, 1943] (Dp--38438); L. H. Pammel s.n. [Montgomery, May 30, 1921] (Io--102655). Tuscaloosa Co.: W. H. Rhoades s.n. [near Tuscaloosa, July 1926] (Bt--30605), s.n. [near Tuscaloosa, Aug. 1927] (N). Wilcox Co.: Buckley s.n. [July 1840] (Br). County undetermined: Buckley s.n. [July 1840] (Br), s.n. (Ca--379992); Peters s.n. [July 4, 1867] (Pa); G. N. Vasey s.n. [1878] (F--307197, Fc--502, Ka); Winchell s.n. (Ms.) MISSISSIP-

PI: Adams Co.: A. R. Moldenke 743 (B); Shimek s.n. [Natchez] (E—119190, F—78633). Claiborne Co.: A. R. Moldenke 741 (B); J. M. White s.n. [Martin] (Na—5711). Forrest Co.: F. A. Barkley 113 (Ok—18435). Hancock Co.: Bonck s.n. [June 9, 1940] (Tl). Harrison Co.: L. H. Pammel s.n. [Gulfport, Jan. 1924] (Io—110972); Pollard 1143 (E—119194, F—171238, W—271648); S. M. Tracy 4982 (Dm, E—119158, Ed, F—81041, Hi—59402, W—341065); Trécul 971 (P, P, P). Jackson Co.: Demaree 32091 (Ok); Diener 694 (Tl); Macfarlane & Goertz s.n. [June 12, 1905] (Up—39350), s.n. [Ocean Springs] (Vu); J. Skehan 22419 (Ur), 22420 (Ur), s.n. [Seymour & Earle 111] (E—942930, Ew, Gg—364183, Hi—59395, Lb—16421, Ur), s.n. [Ocean Springs, 6/7/95] (E—119232), s.n. [Ocean Springs, 8/15/95] (E—119193). Lafayette Co.: A. R. Moldenke 766 (S). Lauderdale Co.: Schuchert s.n. [Meridian] (W—288833). Lowndes Co.: A. R. Moldenke 763 (B). Noxubee Co.: A. R. Moldenke 761 (S). Panola Co.: Eggert s.n. [16 Sept. 1896] (E—119162). Pontotoc Co.: A. R. Moldenke 765 (B). Scott Co.: W. H. Rhoades s.n. [Lake, July 1927] (N). Sharkey Co.: A. R. Moldenke 757 (B). Simpson Co.: Holt 3 (W—587203). Warren Co.: W. H. Rhoades s.n. [Vicksburg, July 1927; H. N. Moldenke 17079] (Bt, N, St). Winston Co.: A. R. Moldenke 756 (B). County undetermined: Gerhart 59 (N); Montgomery s.n. [Nov. 1920] (E—859168). TENNESSEE: Anderson Co.: Wilkens 3713 (Up). Blount Co.: Jennison 37 (O, O), 503 (O). Coffee Co.: C. Black s.n. [Manchester, June 20, 1930] (Go). Franklin Co.: Eggert s.n. [Cumberland Mtn.] (E—119166); Gattinger s.n. [Cowan] (O). Grundy Co.: W. H. Rhoades s.n. [Mt. Eagle] (Hs). Hamilton Co.: Anderson & Jennison 1329 (G), s.n. [Signal Mtn.] (O); Jennison & Anderson s.n. [Chattanooga] (E—978480); Underwood & Sharp 2383 (O). Knox Co.: G. Andrews s.n. [Lyon's View] (E—770172); Ruth 493 (E—119161), 498 (W—345679), 515 (E—119147), s.n. [Aug. 25—Sept. 10, 1898] (Ur). Lauderdale Co.: Sharp, Fairchild, Clebsch, & Clebsch 7954 (No—16494). Lawrence Co.: Sharp, Clebsch, & Clebsch 20 (N). Marion Co.: A. R. Moldenke 776 (S). Morgan Co.: Coffman 91 (W—478876), s.n. [Oct. 1889] (W—478875). Shelby Co.: C. E. Moore 79 (W—1466116). MISSOURI: Taney Co.: J. A. Steyermark 69453 (S, Ur). ARKANSAS: Arkansas Co.: Kellogg s.n. [Arkansas Post] (E—119322, E—879215). Ashley Co.: Demaree 23903 (Ca—882437, N). Baxter Co.: E. J. Palmer 4771 (E—717371, E—717372). Bradley Co.: Demaree 13565 (Ky, N), 18309 (N), 19535 (N). Cleburne Co.: E. J. Palmer 6981 (E—752702, E—787155). Crawford Co.: Demaree 4502b (E—960171), 15277 (N, Se—55736); McKinney 91 (Au); E. J. Palmer 22199 (W—1241148); Shearer s.n. [Aug. 28, 1919] (Vi). Desha Co.: Howell 613 (W—615530). Drew Co.: Demaree 13443 (N). Faulkner Co.: E. S. Ford 98 (Hi—203728, It), 119 (It). Garland Co.: V. H. Chase 9753 (Ur); Demaree 15361 (N, Ok); Earll s.n. [Hot

Springs] (W--491345); Letterman s.n. [Hot Springs] (D--563760, E--119167, E--119171, E--776513, W--985733); Meek s.n. [Hot Springs, 8-11-89] (Io--71116); W. H. Rhoades s.n. [Hot Springs] (Hs); R. Runyon 1203 (N), 1461 (W--1567994); Scully 982 (Sd--23724); Trelease s.n. [Hot Springs] (E--119179); Tweedy 488 (Au). Hempstead Co.: Bush 3837 (E--119316); Demaree 21506 (N). Hot Spring Co.: Demaree 18883 (Bt--55321, Io--152224, Ok); Trelease s.n. [Magnet Cove] (E--119178). Howard Co.: Demaree 9742 (Po--209142). Izard Co.: Demaree 23395 (N); Hubricht B.2277 (N). Jefferson Co.: Demaree 13937 (N). Johnson Co.: Demaree 19977 (N). Lee Co.: Demaree 12973 (Du--367064, N). Logan Co.: Welch 1194 (Dp, Lu); Mrs. H. S. Young s.n. [June 21, 1925] (Cm). Marion Co.: E. J. Palmer 6037 (E--755443, W--588519). Miller Co.: O. M. Clark 3979 (E--1006524); Demaree 24491 (N); Heller & Heller 4158 (E--119180, W--333340); Letterman s.n. [Texarkana] (D--563883, E--770485, W--985731); Pringle s.n. [Texarkana, 30 July 1886] (Vt). Montgomery Co.: Demaree 9603 (E--1034117, O), 39945 (Lb--53420). Nevada Co.: Hollister 28 (W--587722). Phillips Co.: Demaree 19760 (Ca--882438, Gg--316191, N). Pike Co.: L. H. Pammel s.n. [6-10-1911] (Io--81687), s.n. [6/11/1911] (Io--55068). Pope Co.: G. M. Merrill 21 (Cp, Du--246556, E--1030004). Pulaski Co.: R. J. Bailey s.n. [Oct. 17, 1935] (Cm), s.n. [Oct. 24, 1936] (Cm), s.n. [Nov. 1936] (Cm); Coville 13 (W--210608); Demaree 37717 (Lb--46747); Eggert s. n. [7-3-94] (E--119159, E--119160, E--119170, E--119191, Po--64808); Engelmann 205 (E--119303, E--119304); Hasse 2063 (D--586827), s.n. [Little Rock, June 1886] (Al, Ca--192607, Du--90913); Letterman s.n. [Little Rock] (E--770252, W--985732). Saline Co.: J. M. Greenman 4301 [Herb. Drushel 5311] (E--902885, Ur). Sebastian Co.: Bigelow s.n. [Fort Smith] (W--56129). Sevier Co.: Brinkley 38 (F--896442), 338 (Au, Au, F--899057, N); Fassett 27677 (Vi). Washington Co.: P. V. Beck 85 (Ok). Yell Co.: Demaree 18197 (N). County undetermined: Buchholz s.n. [central Arkansas] (E--892615). LOUISIANA: Allen Par.: A. R. Moldenke 711 (S). Avoyelles Par.: A. R. Moldenke 727 (S). Beauregard Par.: A. R. Moldenke 710 (S). Bienville Par.: A. R. Moldenke 684 (B). Bossier Par.: A. R. Moldenke 680 (B); Penn s.n. [Aug. 26, 1941] (Tl); Shoop s.n. [Benton, July 20, 1935] (F--902419); Trelease s.n. [Aldenbridge] (E--119189). Caddo Par.: Moldenke & Woods 555 (S). Calcasieu Par.: Allison 67 (W--514026), 319 (E--119323, F--286541, W--514121); A. Chase 6095 (Mi, W--503449); Gander 7601 (Sd--25488); K. K. Mackenzie 531 (Dt, E--119157, E--119329, Ka); Solereder s.n. [Lake Charles, Sept. 1833] (Mu--4111). Catahoula Par.: A. R. Moldenke 744 (B). DeSoto Par.: A. R. Moldenke 692 (S). East Baton Rouge Par.: S. M. Lewis s.n. [July 15, 1951] (Ur); Romm s.n. [July

15, 1951] (Ur). Evangeline Par.: Ewan 19342 (Tl); A. R. Moldenke 713 (S). Grant Par.: Ewan 17495 (Tl); A. R. Moldenke 725 (B). Iberville Par.: Bush 362 (E—119156, E—129945, W—318509). Jefferson Par.: H. P. Riley s.n. [Grand Isle, May 30, 1938] (Se—47504). La Salle Par.: A. R. Moldenke 745 (S). Livingston Par.: Correll & Correll 9167 (H—75520, N). Natchitoches Par.: L. E. Fox 406 (Nc), 411 (Fx); A. R. Moldenke 695 (S); E. J. Palmer 7924 (D—693548, E—793709, Gg—182157). Orleans Par.: T. Drummond 254 bis (Lu), 254 ter (Ed, Us), s.n. [vicin. New Orleans, 1832] (Lu), s.n. [New Orleans, 1833] (Ed, Ed, Lu). Rapides Par.: C. R. Ball 541 (E—119145, F—93548, W—382819); A. R. Moldenke 726 (S). Red River Par.: A. R. Moldenke 691 (S). Sabine Par.: L. E. Fox 410 (Fx); A. R. Moldenke 696 (S); Shinners 20235 (Ca—46300). Saint Mary Par.: Ewan 18869 (Tl). Saint Tammany Par.: Anect 67 (W—1087035); Arsène 11376 (W—1031498); Bomhard s.n. [Mandeville, Dec. 8, 1928] (Cm); Ewan 17458 (Tl), 17681 (Tl); A. R. Moldenke 246 (Fg, Z); H. P. Riley s.n. [Mandeville, Oct. 25, 1936] (Se—49401). Union Par.: R. Gaines s.n. [6-23-50] (Ca—86357). Vernon Par.: A. R. Moldenke 702 (S). Washington Par.: D. V. Baxter s.n. [Bogalusa, 1931] (Mi); A. G. Watkins s.n. [6-4-33] (Tl). Webster Par.: A. R. Moldenke 683 (B). West Carroll Par.: Moseley s.n. [Holly Ridge] (F—282161). West Feliciana Par.: Ewan 18746 (Tl). Avery Island: Thieret 16087 (W—2422076). Jefferson Island: Thieret 15945 (W—2422031). Weeks Island: Thieret 15934 (W—2422028). Parish undetermined: T. L. Andrews 49 (Io—107277); Barbe s.n. [Basse Louisiana, 1839] (P); Collector undesignated s.n. [Herb. Jussieu 1061] (P, P); Prat s.n. [Louisiana; Herb. Jussieu 5061] (P); Teinturier s.n. [1836] (Dc). OKLAHOMA: Bryan Co.: W. S. Blain 285 (W—1623326), s.n. [Durant, July 8, 1935] (Bt—29669); Bragg 95 (St—15607); E. J. Palmer 10441 (Du—205596, E—804539, Gg—31971). Choctaw Co.: O. F. Hay 103 (Ok); Kilgore 147 (St—13738); E. J. Palmer 8345 (E—784183, E—793710, Gg—31967, Po—220832). Cleveland Co.: D. Simpson s.n. [6-23-38] (Ok). Latimer Co.: M. Cox 62 (St—17514); G. J. Goodman 2047 (E—1087898, N, Ok-10236); A. Hill 83 (St); C. W. Hodges 81 (St—17513); Wallis 7530-1 (St). LeFlore Co.: O. W. Blakley 1498 (E—782299), s.n. [Stevens 1498] (Ok); Demaree 15723 (N), 16036 (N, Ok); Ortenburger s.n. [Kiamitchi River] (W—1365042); E. J. Palmer 20550 (W—1118229), 44086 (N); G. W. Stevens 2688 (Du—67981, E—781217, Ok, St—9178, Ur, W—910034); Stratton 4832 (St—26146, St—26147). Love Co.: Goodman & Rice 5678 (Ok). Marshall Co.: Alder s.n. [July 2, 1950] (Ok); Basler s.n. [Island no. 2, July 2, 1950] (St); G. J. Goodman 1412 (S), 5674 (Ca—81900, Ok, Ur), 6015 (Ok); G. Morgan 64 (S); Starks s.n. [25 July 1950] (Ok); Waterfall 11856 (St), 12299 (St).

McCurtain Co.: Estes 101 (St--17488); M. Hopkins 2883 (Ok, St--14799); Hopkins & Cross 2338 (Ok); Jamison 62 (St--17879); Little & Olmsted 414 (Ok--10232), 1507 (Ok--10233), s.n. [June 28, 1930] (Ok--10234); Neese 102 (St--18301); Nelson, Nelson, & Goodman 5402 (Au, Ok), 5419 (Ok); G. T. Robbins 2648 (Ok), 2660 (Ok), 2826 (Ca--966178); C. C. Smith 908 (Ba, Ok); Stratton 573 (E--946679); Willson s.n. [July 9, 1955] (Ok). Pushmataha Co.: Herb. C. Thomas s.n. [6-15-1937] (Ok); Hopkins & Cross 2218 (Ok); Waterfall 302 (St--9176, St--9177, St). Sequoyah Co.: Wallis 6140 (St), 7996 (St); Waterfall 9533 (St). Tulsa Co.: Herb. Bebb s.n. [bank of Salt Creek] (Ok). County undetermined: C. C. Parry s.n. [Indian Territory, 1878] (Io). TEXAS: Angelina Co.: Boon s.n. [8-7-34] (Au), s.n. [8-10-1934] (Au), s.n. [Aug. 12, 1934] (Au, Au), s.n. [Sept. 1934] (Au, Au). Aransas Co.: Cory 45742 (Au); F. B. Jones 4073 (Ww). Austin Co.: H. Wurzlow s.n. [Industry, 1891] (Ur). Bastrop Co.: C. C. C. Plant Project s.n. [Bastrop State Park, Nov.--Dec. 1936] (Au); Lundell & Lundell 10348 (Ld, Mi); Tharp 253 (Au, Mi), s.n. [Bastrop State Park, Fall 1936] (Mi), s.n. [6-15-37] (Mi). Bexar Co.: Berlandier 1678 (P); Biltmore Herb. 1720j (Dm); Bush 818 (E--119148); Clare 273 (Mi); A. A. Heller 1832 (Ca--104988, E--119235, Ed, Mm--15351, Se--14918, W--213988); G. Jermy 121 (W--315720); J. Jermy 48 (W--501895); Metz 273 (Ms, N, Se--57929), s.n. [San Antonio, Aug. 28, 1931] (Dp); C. C. Parry s.n. [En route from San Luis Potosi to San Antonio, Texas, August 1878] (Io); Wilkinson 12 (E--119146), 119 (E--119187). Blanco Co.: E. J. Palmer 12862 (Ca--425599, E--827554, Gg--31968). Bowie Co.: Milligan s.n. [Dalby Springs] (W--503756); Ward s.n. [west of Texarkana] (W--147597). Brazos Co.: Bain 19 (O); W. S. Jennings 71 (Ok); L. H. Pammel s.n. [College Station, July 1888] (Io--1201), s.n. [College Station, Jul. 26, 1921] (Io--102010), s.n. [College Station] (E--118818, E--119300); Reeves 188 (N, N). Camp Co.: Moldenke & Woods 559 (S). Cass Co.: Cheng s.n. [Atlanta, 6-14-26] (Au). Chambers Co.: G. L. Fisher 7 (F--647719). Cherokee Co.: Trelease s.n. [Forest] (E--119231). Colorado Co.: E. J. Palmer 6592 (E--755442, W--588658). Comal Co.: Lindheimer 297 (E--119230, E--119309, Ka), 1067 (Au, Br, Ca--146951, D--535535, E--119311, Ed, F--218267, Me, Me, Mu--4056, Na--29097, Ok--18037, Up--48982, W--502440). Dallas Co.: Dapprich 7776 (Sm); C. L. Lundell 13930 (N); Lundell & Lundell 7048 (Au, Mh, Mi, N, N); Reverchon 745 (E--119150, E--119330), 3905 (E--119172, E--119331, W--501158), s.n. [Feb. 1872] (E--119318), s.n. [Dallas, 1876] (F--815194); Ruth 1333 (Sm); Shinners 8482 (Ca--733262, N, Sm); Stephenson s.n. [June 19, 1928] (W--1432573). DeWitt Co.: C. H. Mueller 8028 (N, Sm, St); M. Riedel s.n. [6-3-42] (Au). Ellis Co.:

Moldenke & Woods 576 (S); Tharp s.n. [Onion Creek, 6-18-32] (Au, Au). Fayette Co.: Forshey s.n. [Rutersville, 1857] (Ka--95509); Matthes 20 (Dr, Ol). Freestone Co.: Lundell & Lundell 12939 (N). Goliad Co.: C. B. Williams 50 (D--628948, N). Gonzales Co.: Mc Bryde M.517 (Nt), s.n. [6/29/31] (Nt); Normand s.n. [5-31-28] (Au, Au); E. D. Schulz 2666 (La), s.n. [Ottine, Aug. 1924] (Wi), s.n. [Gonzales] (Wi, Wi); Tharp s.n. [Palmetto State Park, 6-30-39] (N). Grayson Co.: C. Richardson 15 (Au), s.n. [Denison, Oct. 17, 1933] (E--1072509); Whitehouse 17487 (Mi, N). Gregg Co.: C. L. York s.n. [Fall 1937] (Au). Guadalupe Co.: Groth 192 (Dt, F--181881, Gg--31970, Io--75833, W--717779). Hardin Co.: Lundell & Lundell 11537 (N). Harris Co.: Armer s.n. [Houston, July 1927] (Sm); Boon 341 (Au), 378 (Au, N); O. Degener 5233 (Ms); G. L. Fisher 88 (W--503159), s.n. [Herb. Banker 2307] (N), s.n. [Houston, June 2, 1912] (Ca--882448, Ew), s.n. [June 9, 1912] (Vi), s.n. [Houston, Aug. 1, 1912] (Ew), s.n. [Houston, Aug. 5, 1912] (Vu), s.n. [Aug. 30, 1912] (Vi), s.n. [Houston, June 2, 1913] (Fs), s.n. [Houston, June 2, 1914] (Vu), s.n. [Aug. 15, 1915] (Gg--200881), s.n. [Houston, Sept. 14, 1930] (Bt--37637), s.n. [Houston, Aug. 4, 1936] (Fs), s.n. [Houston, June 14, 1947] (Go); O. Mueller s.n. [Rose Hill, 8/28/1929] (Wi); L. H. Pammel s.n. [Houston, Jul. 27, 1921] (Io--104611); Tharp s.n. [9-14-33] (Au, Au); Tweedy 118 (W--147598). Harrison Co.: A. R. Moldenke 676 (S). Henderson Co.: B. B. Harris s.n. [7-10-27] (Nt), s.n. [8-6-27] (Nt); A. R. Moldenke 667 (S). Hill Co.: Shinners 10537 (Tl). Hopkins Co.: Moldenke & Woods 566 (S). Jackson Co.: A. R. Moldenke 204 (Fg, S). Jasper Co.: Correll & Correll 12536 (Sm); Cory 49833 (N, Sm); E. R. H. s.n. [Kirbyville, Dec. 21, 1902] (Io--82905). Jefferson Co.: Hook s.n. [Beaumont, Sept. 10, 1932] (Au, Au); A. R. Moldenke 225 (B, Fg, S). Liberty Co.: V. Lehmann s.n. [Cleveland, 6-2-34] (Au). Marion Co.: Moldenke & Woods 554 (S). McLennan Co.: Pace 241 (E--119312); Posey 10 (Nt); L. D. Smith 615 (St). Montgomery Co.: Dixon 247 (F--238186); Warner 1 (Hu). Morris Co.: Moldenke & Woods 556 (S). Nacogdoches Co.: Crausley s.n. [July 18, 1944] (Au); Lundell & Lundell 9615 (Ld, Mi, N), 9653 (Ld, Mi, N). Orange Co.: Kirn s.n. [Orange, 10-18-22] (Wi), s.n. [Orange, 10-27-22] (Wi), s.n. [Orange, Oct. 27, 1927] (Wi); M. S. Young s.n. [Orange, 4/19/18] (Au). Polk Co.: Girvin 101 (Au); Tharp, Turner, & Johnston 54713 (St). Raines Co.: A. R. Moldenke 668 (S). Red River Co.: E. Adams 19 (Nt). Robertson Co.: F. A. Barkley 13590 (Au, Ca--882444, N, Ok, St). San Augustine Co.: Crocket s.n. (W--500016). San Patricio Co.: F. B. Jones 2139 (Ww). Shelby Co.: H. B. Parks Jr. 2310 (Au). Stephens Co.: M. L. Grant 8493 (Ok). Tarrant Co.: Ruth 198 (Au), 1333 (La, Nt, O, W--1288388), s.n. [Hand-

ley, Sept. 12, '10] (Au), s.n. [July 20, 1930] (O); Whitehouse 16158 (Mi, N). Travis Co.: Bogusch 69 (Po--161327); Carsner & Studhalter 4613 (Au); Krodel 35 (Au, Au); McKee & Wesley 3860 (Au); R. H. Painter s.n. [Austin, 8/6/23] (Ka--70282); H. B. Parks s.n. [Aug. 20, 1929] (Wi, Wi); R. B. Payton 54 (Au); Ripperton & Barkley 14524 (Au, Ca--882446); E. D. Schulz s.n. [Austin, 7-11-1920] (Wi), s.n. [Hamilton Pool, 7-11-1920] (Wi), s.n. [10 mi. s. of Austin, 8-13-1921] (Wi), s.n. [Austin, August 1921] (Wi, Wi); Strandtman s.n. [July 17, 1941] (Au); L. C. Taylor 3038 (Ca--697811); Tharp 44416 (Au), s.n. [Austin, 7-21-40] (Ca--882443, N, Pl--151544, Se--75614, Vi), s.n. [Austin, 8-31-41] (Ca--882441, N, Sm), s.n. [Onion Cr., 10-30-41] (Ca--882442); York & Wolf 46 (Au). Trinity Co.: Goodrum s.n. [June 1936] (Au). Upshur Co.: A. R. Moldenke 674 (B, Fg). Van Zandt Co.: Bass 18 (Nt); A. R. Moldenke 671 (S); Sides 7 (Nt); Whitehouse 16452 (Mi, N). Victoria Co.: Ferris & Duncan 3258 (Du--125410, E--893436, Gg--31969). Walker Co.: Dixon 32 (F--237968); C. Hartmann s.n. [Huntsville, summer 1912] (Au, Ca--882447). Waller Co.: E. Hall 438 (E--119182, F--454359, Pa, Po--85767, W--56131). Washington Co.: C. C. Albers 32022 (Au); Brackett 253 (Au), s.n. [7/1/39] (Au). Wilson Co.: Edw. Palmer 1054 (Pa, W--56130); Parks & Cory 15121 (Tr), 15123 (Tr), 15124 (Tr). Wood Co.: A. R. Moldenke 669 (S). County undetermined: Collector undetermined 74 (E--119169); Eggert s.n. (E--119168); Gaut 228 (W--504928); Lindheimer 134 (E-119302, E--119306, E--119307); Schlottmann s.n. [1886] (Ah); Tharp s.n. (Io--104905); M. J. White xxxix [Chronister] (Au). BERMUDA ISLANDS: Main: Brown & Britton 222 (Ca--370289, D--511280, F--203802, Lu, Up--55080, W--524873); O. Degener s.n. [Paget Marsh, Aug. 13, 1921] (Ms). CUBA: Pinar del Río: Acuña 10715 (Es); Britton, Britton, Earle, & Gager 6764 (W--697048); Earle 751 (F--285879); Ekman 10788 (N); León 4400 (Ha), 5106 (Ha), 17897 (Ha); León & Shafer 13607 [Shafer 3215] (Ha); Marie-Victorin & Alain 373 (Vi, Vi); O'Donovan 5306 (Po--64806); Palmer & Riley 547 (W--372985); Shafer 10904 (E--118817, F--325328, W--699179); Van Hermann 864 (F--185454, Po--64805, W--845265), 3165 (Ca--140133, F--200724); Zarragoitia 5306 (F--185737, W--845510). Province undetermined: C. Wright 231 1/2 [Herb. Sauvalle 1772] (Hv), 3168 [1860--1864; Herb. Sauvalle 1772] (Hv), 3168 [1865; Herb. Sauvalle 1772] (Hv, Hv), 3168 [Pulneios] (Pa), 3168 (E--119130, W--56138, W--1361168). ISLA DE PINOS: Britton, Britton, & Wilson 15004 (Cm, F--459550, W--793242); León 17897 (N); Palmer & Riley 1080 (W--372982); A. A. Taylor 230 (F--128571, W--426935). CULTIVATED: Alabama: Justice s.n. [Montgomery, June 28, 1942] (Ba). Belgium: Herb. Martius s.n. (Br); M. Martens s.n. [h. b. Lov. 1838] (Br);

Lejeune s.n. [h. Leod.] (Br). California: Bellue s.n. [Sacramento, Jan. 1942] (Gg--293960). Cuba: J. G. Jack 8664 (Gg--237835). District of Columbia: Vasey s.n. [Agricultural grounds, Washington] (W--56133). Florida: Wedding 115 (Ar--19783). France: Herb. Harvey s.n. [h. R. P. 1819] (Du--166513); Herb. Hort. Paris. s.n. (B); Herb. Monsp. s.n. [1807] (Dc). Georgia: Tidestrom 4112 (Ar--19784), A.112 (Ar--715823). Germany: Herb. Bütner s.n. (B); Herb. Hort. Acad. Helmstedt s.n. [Aug. 1767] (Ed); Herb. Hort. Bot. Monac. s.n. (Mu--1426); Herb. Hort. Sprengel s.n. (B); Herb. A. W. Roth s.n. [hort. Bremen] (B); Herb. Schwägrichen s.n. (Mu--1424). Italy: Herb. Prager 18668 (Gg--31964); Turra s.n. [Vicenza] (S). Java: Herb. Hort. Bot. Bogor. XV.JA.XXIX.5 (Bz--26364). Kentucky: Short s.n. [Aug. 1835] (Ky--1773). Missouri: Herb. Ames s.n. [Saint Louis] (Oa). North Carolina: W. C. Coker s.n. [Arboretum, October 21, 1944] (Hi--27472); V. Matthews s.n. [Arboretum, July 10, 1934] (Hi); Radford & Stewart S.56 (Hi--34969), S.103 (Hi--34982); Smith & Stewart S.103 (Hi). Oklahoma: R. E. Miller s.n. [Stratton 4949] (St--26148). Spain: Collector undesignated 20 (Q), 21 (Q). Texas: C. M. Parker 4792 (Au); Studhalter 4193 (Au). LOCALITY OF COLLECTION UNDETERMINED: Banks s.n. [U.S.A.] (S); Bigelow s.n. [Camp no. 6, July 30, '53] (W--56132); Collector undesignated 42 (Au), s.n. [probably Wichita, Kans.] (Io--108282), s.n. (Au, Au, Dc, Dc, Dc, Du--166514, Mu--1685, Pr); Curtiss s.n. [Southern States, 1875] (Ka, Ky); Dean s.n. (E--119296); Dufour s.n. (Mu--946); Fraser s.n. [Carolina] (Dc); Herb. Bernhardi s.n. (E--119242); Herb. Buckley s.n. (E--119301); Herb. Chapman s.n. [Southern Flora] (Ms); Herb. Hort. Bella s.n. (B); Herb. Jesup s.n. [Southern States] (Dt); Herb. Lamarck s.n. (P); Herb. Link s.n. (B, N--photo, S--photo, Z--photo); Herb. Riehl s.n. (E--119315); Herb. Schimper s.n. (Mu--1425); Herb. Schmiedelian s.n. (Mu--943); Herb. Schreber s.n. (Mu--944, Mu--945); Herb. Zuccarini s.n. (Mu--1686); Joor s.n. (E--119188); Leconte s.n. [Amer. sept.] (P); Lindley s.n. [U. States] (P); L. H. Pammel s.n. [seedlings, March 1927] (Io--126838); Plée 365 (P); Tharp s.n. (Au). MOUNTED ILLUSTRATIONS: Anon., color plate (N); Buchhoz, Herb. Color. Amer. pl. 36. 1783 (Cb); Buchoz, Hist. Nat. Reg. Vég. 6, dec. 10, pl. 5. 1775 (P, P).

CALLICARPA AMERICANA var. LACTEA F. J. Muller, Am. Gard. 10: 463 [as "C. americana lactea"]. 1889; Moldenke in Fedde, Repert. Spec. Nov. 39: 316. 1936.

Additional & emended synonymy: Callicarpa lactea F. J. Muller, Am. Gard. 10: 463. 1889. Callicarpa americana var. alba Hort. ex Rehd. in L. H. Bailey, Stand. Cycl. Hort. 2: 628. 1914. Callicarpa americana var. alba Clute, Amer. Bot. 31: 29. 1925. Callicarpa

americana var. alba Rehd., Man. Cult. Trees, ed. 1, 776. 1927. Callicarpa americana var. alba Berckmanns ex Moldenke in Fedde, Repert. Spec. Nov. 39: 316, in syn. 1936; Prelim. Alph. List Invalid Names 9, in syn. 1940. Callicarpa americana f. leucocarpa Standl. ex Moldenke, Suppl. List Invalid Names 1, in syn. 1941. Callicarpa americana var. albocarpon Fox ex Moldenke, Alph. List Invalid Names Suppl. 1: 3, in syn. 1947. Callicarpa americana f. lactea (F. J. Muller) Rehd., Bibl. Cult. Trees 584. 1949. Callicarpa americana var. leucocarpa Standl. ex Moldenke, Résumé 241, in syn. 1959. Callicarpa americana alba L. H. Bailey ex Moldenke, Résumé Suppl. 14: 6, in syn. 1966.

Bibliography: F. J. Muller, Am. Gard. 10: 463. 1889; C. Mohr, Contrib. U. S. Nat. Herb. 6: 695. 1901; F. S. Earle, Bull. Ala. Agr. Exp. Sta. 119: 101. 1902; C. K. Schneid., Illustr. Handb. Laubholzk. 591. 1911; Rehd. in L. H. Bailey, Stand. Cycl. Hort. 2: 628. 1914; Clute, Amer. Bot. 31: 29. 1925; Rehd., Man. Cult. Trees, ed. 1, 776. 1927; L. H. & E. Z. Bailey, Hortus 111. 1930; L. H. Bailey, List Florists Handl. Verbenac. mss. 1935; Moldenke in Fedde, Repert. Spec. Nov. 39: 303, 306, & 316—317 (1936) and 40: 117--119, 121, 123, 127, & 128. 1936; Moldenke, Geogr. Distrib. Avicenn. 2--4 & 35. 1939; Rehd., Man. Cult. Trees, ed. 2, pr. 1, 804 & 932. 1940; Moldenke, Prelim. Alph. List Invalid Names 9 & 11. 1940; Moldenke, Suppl. List Invalid Names 1. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 4, 5, 12, 71, & 86. 1942; Moldenke, Alph. List Invalid Names 8 & 9. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 77 & 79—80. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 1. 1943; Moldenke, Phytologia 2: 73, 88, & 93 (1945) and 2: 155. 1946; Moldenke, Alph. List Cit. 1: 19, 20, 37, 158, 175, 202, 203, 209, 305, & 309. 1946; Moldenke, Phytologia 2: 327. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 3. 1947; Moldenke, Bol. Soc. Venez. Cienc. Nat. 11: 41. 1947; Moldenke, Wrightia 1: 245. 1948; Moldenke, Alph. List Cit. 2: 327, 421, 426, 509, 526, & 574 (1948), 3: 678, 706, 721, 725, 789, 798, 841, & 869 (1949), and 4: 1025, 1246, & 1252. 1949; Rehd., Bibl. Cult. Trees 584. 1949; Moldenke, Known Geogr. Distrib. Verbenac., ed. 2, 7—10, 18, 22, 156, & 176. 1949; Bean in Chittenden, Roy. Hort. Soc. Dict. Gard. 1: 359. 1951; Moldenke, Phytologia 3: 450. 1951; Krüssman, Handb. Laubgeh. 1: 254. 1959; Moldenke, Résumé 9—12, 14, 22, 23, 27, 213, 241, 244, & 443. 1959; Rehd., Man. Cult. Trees, ed. 2, pr. 9, 804 & 932. 1960; Moldenke, Résumé Suppl. 3: 3 & 5 (1962) and 4: 1 & 10. 1962; Li, Morris Arb. Bull. 14: 5. 1963; Moldenke, Résumé Suppl. 14: 1 & 6. 1966.

Recent collectors describe this plant as a shrub, 1 m. tall, the flowers white, and the fruit shining, white or milky-white to snowy-white or pearly-white. Clute (1925) states that both the flowers and fruits are white. His var. alba is based on an unnumbered collection made by H. A. Rankin in Columbus County, North Carolina. Matthews also avers that the flowers are "pure-white" as well as the fruit. Earle (1902) says "a form with white fruit occurs" in Alabama. A note on W. C. Coker s.n. [Arboretum, October 21, 1944]

makes the following amazing claim: "White-berried form and purple-berried form from same root" — the specimen consists of just two branchlet tips, the fruits on both of which have dried identically as those of the normal form. Ewan notes "growing with the usual red-purple shrubs" in Evangeline Parish, Louisiana.

Callicarpa americana var. alba Berckmanns is based on F. S. Earle s.n., collected at Auburn, Lee County, Alabama, on September 25, 1897, and deposited in the herbarium of Kansas State College; var. albocarpon Fox is based on L. E. Fox 2226 from Natchitoches Parish, Louisiana, deposited in the Fox herbarium; and f. leucocarpa is based on G. L. Fisher s.n., collected at Anahuac, Chambers County, Texas, on September 18, 1931, and deposited in the herbarium of the Chicago Natural History Museum.

The variety was collected 5 miles south of Silsbee, Hardin County, Texas, on September 15, 1936, by H. B. Parks & V. L. Cory and 2 1/2 miles northwest of Shepperd, San Jacinto County, on September 12, 1936; at Sebring, Florida, by J. B. McFarlin; at Anahuac, Chambers County, Texas, on September 18, 1931, by G. L. Fisher; in a pine forest northwest of Jasper, Jasper County, Texas, September 10, 1942, by C. L. Lundell; in old fields at Lake City, Columbia County, Florida, by P. H. Rolfs; at Rustin, Lincoln Parish, Louisiana, in September, 1914, by R. S. Cocks; at Greenville, Pitt County, North Carolina — "apparently a great rarity" — on September 30, 1926, by S. N. Crisp; and in the Glen Saint Mary Nursery, Baker County, Florida, on August 20, 1935, by L. H. Bailey and by H. H. Hume.

Dr. Edgar T. Wherry, in a letter to me dated January 9, 1937, states that in about 1920 he visited the Berckmanns place in August, Georgia, and that the widow of the founder pointed out C. americana var. lactea as one of the most interesting plants there. On September 11, 1936, he collected the variety about 3 miles northwest of Robert Post Office, which is just east of Hammond, Tangipahoa Parish, Louisiana. It was growing with the typical form of the species, although the bush of albino nature was obviously weaker, lower, and paler.

Collectors have found the plant growing in old fields and on dry hills, at 550 feet altitude, flowering in July, and fruiting from August to October. Bailey (1935) states that it is offered to the horticultural trade by Sanford. Common names recorded for it are "French mulberry" and "white-fruited callicarpa". In all, 15 herbarium specimens, including type material of most of the names involved, and 6 mounted photographs have been examined by me.

Additional & emended citations: NORTH CAROLINA: Orange Co.: Le Clair s.n. [Mason Farm, July 15, 1937] (Hi—6300), s.n. [Mason Farm, July 1937] (Hi—8985). Pitt Co.: Crisp s.n. [Greenville, Sept. 30, 1926] (Hi—59407). SOUTH CAROLINA: Beaufort Co.: Mellichamp s.n. [Bluffton] (E—119216). FLORIDA: Baker Co.: H. H. Hume s.n. [Glen St. Mary, 20 Aug. 1935] (Fl—20936). Columbia Co.: Rolfs 183 (F—228793), 184 (E—119151, F—228794, Fl—20945, Ur).

Highlands Co.: McFarlin 6468 (Mi), 9746 (N). ALABAMA: Lee Co.: F. S. Earle s.n. [Auburn, Nov. 1878] (Cm), s.n. [Auburn, 9-25-1897] (Ka), s.n. [Auburn, Nov. 1898] (F--170730, W--344528). ARKANSAS: Hot Spring Co.: Demaree 16543 (N, Ok, Se--55743). LOUISIANA: Evangeline Par.: Ewan 19360 (Tl). Lincoln Par.: Cocks s.n. [Rustin, Sept. 1914] (Tl). Natchitoches Par.: L. E. Fox 2226 (Fx). TEXAS: Chambers Co.: G. L. Fisher 6 (F--647696), s.n. [Anahuac, Sept. 18, 1931] (Du--283952, Ew, Wi). Hardin Co.: Parks & Cory 19988 (Tr), 19989 (Tr). Jasper Co.: C. L. Lundell 11890 (Sm). San Jacinto Co.: Parks & Cory 19650 (Tr). Upshur Co.: E. J. Palmer 31738 (E--956795). CULTIVATED: Florida: L. H. Bailey s.n. [Glen St. Mary Nursery, Aug. 20, 1935] (Ba). North Carolina: V. Matthews s.n. [July 11, 1934] (Hi--59412). MOUNTED CLIPPINGS: Clute, Amer. Bot. 31: 29. 1925 (Up).

CALLICARPA AMPLA Schau.

Synonymy: Catlicarpa ampla Schau. ex Moldenke in Fedde, Repert. Spec. Nov. 42: 242, sphalm. 1937.

Bibliography: Schau. in A. DC., Prodr. 11: 642. 1847; Jacks. in Hook. f. & Jacks., Ind. Kew. 1: 386. 1893; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; Urb. in Fedde, Repert. Spec. Nov. 18: 119. 1922; Britton & P. Wils., Scient. Surv. Porto Rico 6 (1): 147. 1925; Moldenke in Fedde, Repert. Spec. Nov. 39: 296 & 302 (1936), 40: 48--49, 77, 83, 120, 122, 123, 125, 128, 129, & 131 (1936), and 42: 242. 1937; Moldenke, Phytologia 1: 234. 1937; Moldenke, Alph. List Common Vern. Names 7. 1939; Moldenke, Geogr. Distrib. Avicenn. 7 & 8. 1939; Moldenke, Suppl. List Common Vern. Names 5. 1940; Moldenke, Phytologia 1: 497. 1941; Moldenke, Known Geogr. Distrib. Verbenac., ed. 1, 27 & 86. 1942; Moldenke, Phytologia 2: 43, 69, & 93. 1945; Moldenke, Alph. List Cit. 1: 33, 34, 117, 179, & 301 (1946), 2: 347, 403, 420, 436, 528, 554, & 640 (1948), 3: 695, 822, 853, 854, 856, 916, 937, 938, & 958 (1949), and 4: 1026, 1058, & 1147. 1949; Moldenke, Known Geogr. Distrib. Verbenac., ed. 2, 49, 50, & 176. 1949; Moldenke, Résumé 58, 59, 250, & 443. 1959.

Recent collectors describe this plant as a small tree, 15 feet tall, the trunk 3 inches in diameter at breast height, with the fruits "whitish with a tinge of purple, possibly not fully mature". It has been collected in woods, fruiting in September. A vernacular name is "capa rosa". Jackson (1893) ascribes the species to Jamaica in error. Urban (1922) compares C. oblanceolata Urb. with C. ampla as follows: "Ex antillanis maxime accedit ad C. amplam Schauer (e Portorico), quae foliis ovatis v. ellipticis, margine supero crenatis v. crenulatis, subtus prominenti-reticulatis, multo tenuioribus, fructibus minoribus facile discernenda est."

Material has been misidentified and distributed in herbaria under the name Egiphylla macrophylla H.B.K.

In all, 60 herbarium specimens, including type material of all the names involved, and 21 mounted photographs have been examined

by me.

Additional & emended citations: PUERTO RICO: Baudin 208 [Herb. Jussieu 5071] (P); Eggers 1297 (W—1323254); Holdridge 245 (N); Ledru 148 (P), s.n. [Herb. Jussieu 5071] (P); Sintenis 2066 (W—1323265), 2165 (Lu, Mu—3839, W—1323264), 4530 (Bg, Lu, W—403410), 4583 (E—119132, F—79945, Lu, Mu—3768, Vu); Wydler 283 [Macbride photos 33930] (B—photo of isotype, Dc—type, Dc—isotype, F—969769—photo of isotype, Kr—photo of isotype, Mi—photo of isotype, N—photo of type, N—photo of isotype, S—photo of type, S—photo of isotype, Z—photo of type). VIRGIN ISLANDS: St. Thomas: Riédlé 42 (P), s.n. (P). LOCALITY OF COLLECTION UNDETERMINED: Baudin s.n. (P); Plée s.n. (P, P); Riédlé s.n. (P).

CALLICARPA ANGUSTA Schau. in A. DC., Prodr. 11: 642. 1847.

Synonymy: Callicarpa angusta var. typica H. J. Lam, Verbenac. Malay. Arch. 66. 1919. Callicarpa acuta Schau. ex P. Dop, Bull. Soc. Hist. Nat. Toulouse 64: 509 & 512, in obs. 1932. Callicarpa acuta var. typica H. J. Lam ex P. Dop, Bull. Soc. Hist. Nat. Toulouse 64: 509 & 512, in obs. 1932.

Bibliography: Schau. in A. DC., Prodr. 11: 642. 1847; Miq., Fl. Ind. Bat. 2: 889. 1856; Vidal, Revis. Pl. Vasc. Filip. 208. 1886; Maxim., Bull. Acad. Sci. St.-Pétersb. [Mél. Biol.] 12: 506. 1886; Jacks. in Hook. f. & Jacks., Ind. Kew. 1: 386. 1893; E. D. Merr., Philip. Bur. Forest. Bull. 1: 51. 1903; King & Gamble, Journ. Roy. Asiat. Soc. Bengal 74 (2), extra no., 805. 1908; King & Gamble, Mat. Fl. Malay. Penins. 21: 1015. 1909; E. D. Merr., Philip. Journ. Sci. Bot. 7: 341 (1912) and 12: 299 & 301. 1917; H. J. Lam, Verbenac. Malay. Arch. 48, 58, 66, & 67. 1919; Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 10 & 19. 1921; E. D. Merr., Enum. Philip. Pl. 3: 382. 1923; P. Dop, Bull. Soc. Hist. Nat. Toulouse 64: 509 & 512. 1932; Moldenke, Alph. List Common Vern. Names 10. 1939; Moldenke, Prelim. Alph. List Invalid Names 9. 1940; Moldenke, Known Geogr. Distrib. Verbenac., ed. 1, 61 & 86. 1942; Moldenke, Alph. List Invalid Names 8. 1942; Moldenke, Phytologia 2: 93. 1945; Moldenke, Alph. List Cit. 1: 5 (1946) and 2: 463 & 470. 1948; Moldenke, Known Geogr. Distrib. Verbenac., ed. 2, 140 & 176. 1949; Moldenke, Résumé 182, 241, & 443. 1959; Moldenke, Phytologia 13: 438 & 439. 1966; Moldenke, Résumé Suppl. 14: 5. 1966.

Shrub, about 2 m. tall; stems about 4 cm. in diameter; branchlets white stellate-tomentose; leaves decussate-opposite; petioles 4—18 mm. long, with only little developed interpetiolar margin, white stellate-tomentose; leaf-blades membranous, lanceolate, 7.5—18 cm. long, 1.7—4 cm. wide, attenuate or acuminate at the apex, minutely denticulate or serrate-denticulate along the margins, attenuate to acuminate or cuneate at the base, green and pulverulent or somewhat farinose above (when immature?, perhaps glabrous when mature?), stellate-tomentose and reticulate-venose beneath; inflorescence cymose, lax, divaricate-dichotomous, white stellate-tomentose, scarcely many-flowered; peduncles as long as or almost as long as the petioles; flowers small; calyx 2 mm. long, the rim

obscurely 4-toothed or very minutely 4-mucronulate; corolla white, twice as long as the calyx, 4 mm. long, tomentose-hairy on the outside; stamens and style long-exserted; mature fruit white, less than 2 mm. in diameter, not depressed at the apex, with scattered stellate hairs.

The type of this species was collected by Hugh Cuming (no. 1425) near Albay, in central Luzon, Philippine Islands, and was originally deposited in the August Friedrich Theodor Lucae herbarium in Berlin. The species has been found growing in secondary forests, on dry soil, in open forests, and along streams and damp forest streams, at altitudes of 1000 to 2000 feet, flowering in February and October, fruiting in February, March, and October. The flowers are described as "white" on Herb. Philip. Bur. Sci. 46685, while it is the fruits that are said to be white on Herb. Philip. Bur. Sci. 46741 & 46829. A vernacular name recorded for the species is "dirik-dirik".

Maximowicz (1886) compares his C. pilosissima with C. angusta as follows: "Similis Callicarpa angustae Schauer (Cuming! n. 1425) e Philippinis, quae tamen differt pube, foliis subtus incanis basi cuneatis, corolla extus tomentosa; nec non Callicarpa caudatae m., cujus diagnosim inserere liceat...."

Lam (1919) cites a "Com. d. l. Fl. for. d. Fil. no. 425" from Luzon as the typical form of C. angusta. By this curious citation he probably means Cuming 1425, the type collection. His var. longifolia, said to differ in its larger leaves, 9--18 cm. long, 1.7--4 cm. wide, the petioles 8--18 mm. long, and the venation abundant but obscure on both leaf-surfaces, is C. rivularis Merr. He also cites under C. blancoi Rolfe [=C. formosana Rolfe], with a question, a Teijsmann s.n. [Herb. Lugd.-Bat. 908.265-307] determined as C. angusta by Hasskarl.

Material of C. angusta has been misidentified and distributed in herbaria under the names C. bicolor Juss., C. cana L., and C. longifolia Lam. On the other hand, the Loher 12589, distributed as C. angusta, is actually C. longipetiolata var. glabrescens Moldenke; Loher 12312 and Ramos & Edaño s.n. [Herb. Philip. Bur. Sci. 48530] are C. subintegra Merr.; and Ramos & Edaño s.n. [Herb. Philip. Bur. Sci. 33838] is Geunsia ramosi Moldenke.

In all, 23 herbarium specimens, including type material of all the names involved, and 1 mounted photograph, have been examined by me.

Citations: WESTERN PACIFIC ISLANDS: PHILIPPINE ISLANDS: Luzon: Ahern's collector s.n. [Herb. Philip. Forest. Bur. 1888] (Bz--17247, N, Po--64811); Cuming 1425 (N--isotype, Z--photo of isotype); M. Ramos 1958 (Bz--17273), s.n. [Herb. Philip. Bur. Sci. 1030] (Bz--17248, N); Ramos & Edaño s.n. [Herb. Philip. Bur. Sci. 26367] (Bz--17250), s.n. [Herb. Philip. Bur. Sci. 34051] (N), s.n. [Herb. Philip. Bur. Sci. 46685] (Ca--309226, N), s.n. [Herb. Philip. Bur.

Sci. 46741] (Ca--309183, N), s.n. [Herb. Philip. Bur. Sci. 46829] (Ca--309331). Mindoro: Merritt s.n. [Herb. Philip. Forest. Bur. 8788] (N); M. Ramos s.n. [Herb. Philip. Bur. Sci. 39455] (Bz--17249, N), s.n. [Herb. Philip. Bur. Sci. 39497] (Bz--17245, Bz--17246). Palawan: Foxworthy s.n. [Herb. Philip. Bur. Sci. 660] (Bz--17595, N), s.n. [Herb. Philip. Bur. Sci. 719] (Bz--17594, N).

CALLICARPA ANGUSTIFOLIA King & Gamble, Kew Bull. Misc. Inf. 1908: 106. 1908.

Bibliography: King & Gamble, Journ. Roy. Asiat. Soc. Bengal 74 (2), extra no., 802 & 804--805. 1908; King & Gamble, Kew Bull. Misc. Inf. 1908: 106. 1908; King & Gamble, Mat. Fl. Malay. Penins. 21: 1014--1015. 1909; Prain, Ind. Kew. Suppl. 4: 34. 1913; H. J. Lam, Verbenac. Malay. Arch. 48 & 66--67. 1919; Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 10 & 19. 1921; H. N. Ridl., Fl. Mal. Penins. 2: 614 & 616. 1923; Calder, Narayanaswami, & Ramaswami, Rec. Bot. Surv. Ind. 11: 24. 1926; P. Dop, Bull. Soc. Hist. Nat. Toulouse 64: 502, 503, 511, & 512. 1932; Moldenke, Known Geogr. Distrib. Verbenac., ed. 1, 59, 60, 63, 66, & 86 (1942) and ed. 2, 137, 138, 143, 147, & 176. 1949; Moldenke, Phytologia 3: 296 (1950) and 4: 122 & 123. 1952; Moldenke, Résumé 177, 179, 187, 196, & 443. 1959.

Low, slender, twiggy shrub, to 4 m. tall; branchlets obtusely or obscurely quadrangular, grayish or ferruginous with an appressed tomentum of stellate hairs; leaves decussate-opposite, their bases joined by a well-marked ridge; petioles 1.25--2.5 cm. long, canaliculate, connected by a prominent interpetiolar margin; leaf-blades subcoriaceous, lanceolate or narrow-lanceolate, 10--18 cm. long, 2--4 cm. wide, slightly recurved, long-acuminate at both ends or acutely attenuate at the apex and decurrent into the petiole at the base, entire or rarely very obscurely denticulate, dark above, appressed grayish- or ferruginous-tomentose with stellate hairs above when immature, glabrous above when mature, permanently densely stellate-tomentose beneath with grayish-white, silvery, or tawny pubescence; midrib stout, impressed above, prominent beneath; secondaries slender, 9--15 per side, elevated, more or less irregular, issuing at 60--70° from the midrib and at once curving upwards to and along the margins, joined by subparallel transverse tertiaries; inflorescence axillary, cymose; cymes sessile or short-pedunculate, 1.2--2 cm. long, few-flowered, 2 cm. wide, widely dichotomous; peduncles 6--8 mm. long; bractlets linear-subulate; pedicels very short, jointed; flowers rather large; calyx campanulate, 2 mm. long, densely stellate-tomentose on the outer surface, glabrous within, the rim very short-mucronulate; corolla violet or violet-pink to bluish-pink, bluish-red, or white, twice as long as the calyx, densely stellate-tomentose on the outer surface, glabrous within, its tube 4 mm. long, stellate-pubescent outside, the lobes erect, rounded; stamens inserted at or very near the base of the corolla-tube, hardly exserted; filaments 4 mm. long, slender, scarcely or not at all exserted; anthers oblong, 1.5 mm. long, much glandular-dotted on

both sides; style slender, exserted; stigma capitate; ovary villous; fruit drupaceous, globose, 2.5--3.5 mm. in diameter, depressed at the apex, black or dark-blue when ripe, glabrous; pyrenes 4.

This species was based on a collection of Henry Nicholas Ridley (no. 8330) from Lankawi Island, one of Charles Curtis (no. 3197) from Ipoh, Perak, one of Benedetto Scortechini (no. 1596) from Batu Kuran, Perak, and two made by Ulu Buboug (King's collector nos. 7036 & 8236) from the top of limestone hills, at 200--300 meters altitude, in Perak, Malaya. Ridley (1923) cites a Ridley specimen from Selangor and a Curtis collection from Lankawi Island.

The species has been found growing on limestone, limestone rocks, limestone cliffs, and the cleared tops of limestone hills, at 500 to 1300 feet altitude, flowering in October and November, and fruiting in February. The flowers are described as "violet" on Bünnemeijer 1906 and as "white" on Gusdorf 96. The leaves on Nur 34369 are especially small. King & Gamble (1908) note that "The Kedah specimens [by which they mean those from Lankawi Island] have narrower leaves than the rest, with more slender branchlets. The species comes near to C. angusta, Schauer, from the Philippines, but differs in the almost quite entire leaves and larger flowers and fruit." Lam (1919) says "The species has close affinity with C. angusta var. β [=C. rivularis Merr.] and perhaps it will appear that it is synonimous with it. But it seems to differ from it by the pubescent corolla and the hardly denticulate leaves."

In all, 21 herbarium specimens have been examined by me.

Citations: THAILAND: Khantchai 1087 [Herb. Roy. Forest Dept. 24217] (Z). MALAYA: Kelantan: M. R. Henderson 19597 (Bz--17260, Ca--342713); Nur & Foxworthy 12114 (Bz--17259, Ca--346272). Pahang: M. R. Henderson 22265 (Bz--17258, N), 25049 (N). Perak: M. R. Henderson 23754 (Bz--17261), 23805 (N). Selangor: Nur 34369 (Ca--3100, S). MALAYAN ISLANDS: Langkawi: M. R. Henderson 29152 (Bz--17257). INDONESIA: GREATER SUNDA ISLANDS: Banka: Bünnemeijer 1906 (Bz--17252, Bz--17253); Teijsmann s.n. (Bz--17254, Bz--17255, Bz--17256, Ca--265958, Ut--53171).

CALLICARPA ANOMALA Ridl.

Bibliography: Moldenke, Known Geogr. Distrib. Verbenac., ed. 1, 65 & 86 (1942) and ed. 2, 145 & 176. 1949; Moldenke, Résumé 192 & 443. 1959.

It does not seem that this binomial was ever validly published with a description of any sort. This species is said to be endemic to Sarawak, but whatever the original source of this information was when I published it in 1942 has since been lost.

CALLICARPA ARBOREA Roxb., Hort. Beng. [10], hyponym. 1814; Fl. Ind., ed. 1 [Carey & Wall.], 1: 405--406. 1820 [not C. arborea Merr., 1940, nor Miq., 1885, nor Wall., 1829].

Additional & emended synonymy: Callicarpa villosa Roxb., Hort. Beng. [10], hyponym. 1814 [not C. villosa Baldw., 1936, nor Vahl, 1794]. Callicarpa tectonaefolia Wall., Numer. List 50, no. 1827. 1829. Callicarpa arborea var. villosa (Roxb.) King & Gamble, Journ. Asiat. Soc. Bengal 74 (2), extra no., 803 [as "var. villosa Roxb.]. 1908. Callicarpa lanata Hosséus apud Craib, Contrib. Fl. Siam Dicot. 163, in syn. 1912 [not C. lanata Gamble, 1878, nor L., 1771, nor H. J. Lam, 1940, nor Lam., 1821, nor Schau., 1893, nor Vahl, 1856, nor Wall., 1940, nor Zipp., 1841]. Callicarpa arborea var. villosa King & Gamble ex Craib, Contrib. Fl. Siam Dicot. 163. 1912. Callicarpa tectoniolia Wall. ex Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 21, sphalm. 1921. Callicarpa arborea var. villosa Gamble ex H. N. Ridl., Fl. Malay. Penins. 2: 615. 1923. Callicarpa tomentosa Bakh. (in part) apud P'ei, Verbenac. China 21, in syn. 1932 [not C. tomentosa Hook. & Arn., 1918, nor König, 1893, nor L., 1959, nor (L.) Murr., 1774, nor Lam., 1783, nor Murr., 1774, nor Thunb., 1959, nor Vahl, 1794, nor Willd., 1808]. Callicarpa arborea var. villosa Fletcher ex Moldenke, Résumé Suppl. 14: 6, in syn. 1966. Callicarpa tomentosa f. arborea (Roxb.) Bakh. ex Moldenke, Résumé Suppl. 14: 7, in syn. 1966. Callicarpa tomentosa f. villosa (Roxb.) Clarke ex Moldenke, Résumé Suppl. 14: 7, in syn. 1966. Callicarpa tomentosa var. arborea (Roxb.) Bakh. ex Moldenke, Résumé Suppl. 14: 7, in syn. 1966. Callicarpa tomentosa f. villosa (Roxb.) King & Gamble ex Moldenke, Résumé Suppl. 14: 7, in syn. 1966.

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Illustrations: Basu, Ind. Medic. Pl. 3: pl. 732a. 1918; H. N. Ridl., Fl. Malay Penins. 2: 615, fig. 128. 1923; Nair & Rehman, Bull. Nat. Bot. Gard. Lucknow 76: pl. 2, fig. 8. 1962.

Bush, 2—5 m. tall, or small to medium or even tall, slender or stout, branched, deciduous tree, to 25 m. tall, usually moderate-sized and spreading, all the younger parts shortly grayish or yel-

lowish mealy-tomentose; trunk stout, nearly erect, to 46 cm. in diameter at breast height and 85 cm. in girth, the bole 2 m. tall; wood light in weight, rather soft or moderately hard, white or gray to light brownish-white, light-brown, or straw-brown, loose- or even-grained, taking a beautiful polish, the annual rings visible; head round; bark gray or grayish to pale gray-brown or brownish, smooth or rough, longitudinally fissured, tawny-gray on shoots, the inner bark pale-brown; branches stout, spreading or long-straggling, mealy-tomentose; branchlets thick or stout, obtusely tetragonal, densely cinereous- or flavescent-furfuraceous or covered with dense gray-tawny or reddish-brown forked stellate or mealy tomentum on the younger parts, less so in age; nodes annullate; principal internodes 3.5—5.8 cm. long; leaf-scars sunken; leaves decussate-opposite; petioles stout or very stout, 2—7 cm. long, canaliculate above, many-furrowed in drying, densely cinereous-furfuraceous or mealy-tomentose; leaf-blades chartaceous or coriaceous, firm, light- or dark-green and shiny above, white beneath, ovate, broadly elliptic, or elliptic-ovate to oblong, oblong-ovate, or elliptic-lanceolate, ventricose, 11—34 cm. long, 5—14.3 cm. wide, conspicuously and equally tapering toward both ends or acuminate or caudate-acuminate to short-acuminate or bluntish-acuminate at the apex, entire or sometimes distantly denticulate, abruptly acute to long-acute or cuneate at the base or even centrally decurrent-acute in a rounded or subcordate base, smooth and glabrous or glabrescent (except for the midrib) above when mature, very densely furfuraceous-tomentellous, glaucous-tawny, gray-tomentose, or closely stellate-tomentose beneath with very short, white, closely appressed tomentum, very mealy-tomentose like the branchlets on both surfaces when immature and unexpanded; midrib stout or very stout, flat above, very prominent beneath; secondaries slender or stout, 7—14 per side, issuing at an angle of about 55° from the midrib and gently arcuate-ascending to the margins, where they almost anastomose above and are arcuately joined beneath, flat but plainly visible above, prominent or prominulent beneath, joined by fairly regular and prominent transverse tertiaries; vein and veinlet reticulation slender, abundant, flat but usually quite visible above, prominulent beneath; inflorescence axillary or supra-axillary, large, solitary or paired and opposite at the tips of the branchlets, 6—15 cm. long, 4—14.5 cm. wide, compound, subglobular, conspicuously 6—8 times dichotomously branched with wide-spreading branches, mealy-tomentose like the branchlets, all the ramifications somewhat tetragonal; cymes very many-flowered; peduncles stout, 2.5—7.5 cm. long when mature, densely furfuraceous like the branchlets and the divisions of the inflorescence; bracts none; bractlets numerous, linear or linear-subulate, 2—25 mm. long, furfuraceous; prophylla linear, small or minute, furfuraceous; flowers small, very numerous, almost sessile, sweet- or rather offensive-scented; pedicels very short; buds lilac, puberulent at first on the outside, later glabrous; calyx campanulate or infundibular, pale-green, 1—2.2 mm. long, 1.5—2 mm. wide, mealy or rather densely pulverulent-puberulent on the outside,

glabrous on the inner surface, the rim truncate and obscurely 4-repand-denticulate or obscurely and minutely 4-toothed; corolla infundibular, small, varying from blue, light-blue, mauve, or lilac to deep-lilac, lilac-purple, purple, pale-purple, lively purple, or rose-purple, sometimes violet, pale-violet, red, dull-red, pink, pale pinkish, rose-pink, old-rose, rose-lavender, or even "yellow", exserted, its tube usually much longer than the calyx, narrow-cylindric, 1.5—3 mm. long, slightly widened at the apex, puberulent or very minutely pulverulent-puberulent on the outside, its limb 4-parted, the lobes rounded-lingulate, 1—1.5 mm. long and wide or as long as the tube, subquadrate, obtuse at the apex, reflexed, villous or pulverulent-puberulent on the outside, one smaller than the rest; stamens 4, inserted 0.5—0.7 mm. above the base of the corolla-tube, long-exserted; filaments slender, mauve, 3.5—4.5 mm. long or twice as long as the corolla, glabrous; anthers yellow, bright-yellow, or brown, short, oblong, about 1 mm. long and 0.5 mm. wide, opening by longitudinal slits, dorsifixed near the base, glandular-punctate on the back; pollen-grains 3-zonicolpate, rarely syncolpate, prolate, 43 x 31 μ, with a range of 42—46 x 28—32 μ, the colpi ends acute, the margin slightly wavy, the colpus 2—8 μ at the middle of the mesocolpium, becoming thinner toward the colpi ends, the apocolpium 7 μ in diameter, the exine 2.8 μ thick, the ectine almost as thick as the endine, pilate, more or less areolate, the columella clear and closely packed, most of the grains folding along the aperture; pistil exserted; style capillary, mauve, 4.5—5 mm. long, glabrous; stigma at first capitate or peltate, about 0.5 mm. wide, later broadly infundibular; ovary superior, globose, about 1 mm. long and wide, densely puberulent, 1-celled, polished; fruiting-calyx small and patelliform, glabrate; fruit drupaceous, small, round or subglobose to globular, succulent, green or greenish when young, later pinkish, magenta, magenta-purple, purple, violet, or lilac, ultimately ripening blackish, blue-black, purple-black, or black, 2—6 mm. long and wide, glabrous, smooth or wrinkled in drying; seeds 4 or less, convex on the outside, with 2 flat faces on the inner surface, rough, the interior integument hard like the shell of a nut; perisperm oval, soft, amygdaline; embryo straight, erect, nearly as long as the perisperm; cotyledons oblong; radicle oblong, as long as the cotyledons, inferior.

It is said that 9-year old trees of this species may have a trunk circumference of 33 inches 4 feet above the ground. Razi (1946) describes it as a microphanerophyte according to Raunkiaer's classification of life-forms and records it from Mysore. The flowers have been described as "pink" on Brass 528, Carr 11535, M. S. Clemens 10870, Khantchai 1080, and Tsang 23914; "rose-lavender" on Koelz 20534; "lilac" on Bünnemeijer 248; "dull-red" on Forrest 24684; "purple" on Chamruaengari 39, Chand 4452, Corner 37691, Kingdon-Ward 22196, Koelz 22718, Sindhiponse 45, and Yates 2651; "light-blue" on Asdat 2; "blue" on Yates 1078; "mauve" on Hoogland 3905; "rose-purple" on Koelz 30119; "violet" on Bunkird s.n.; "old-rose" on Koelz 25478; "lilac or rose-pink" on Hanff 249; and

"yellow" on Khantchai 350.

The species has been found growing in forests, marshy or deciduous forests, dipterocarp or mixed evergreen forests, riverine rainforests, open or open grassy places, the margins of mixed thickets, second growth, and dry situations, near plantations, at the base of limestone cliffs, in open woods, by streams, in thickets, and amongst scrub, from sea-level to 8000 feet altitude, flowering and fruiting from December to October. Roxburgh states that it "Flowers at various times through the year" at Chittagong. Tsang refers to it as "scattered shrubs, climber, 9 feet tall" in Kwangsi. Brass calls it "common in gully rainforest association" in Papua; Yates says "in open grassland to second growth forest" in Sumatra. Kingdon-Ward describes it as "very common in second growth at old cultivation" in Burma; Hoogland found it "along river at edge of degenerate rainforest on welldrained alluvial soil" in New Guinea. In Thailand it is said by Sindhiponse to be "common in deciduous forests" and by Khantchai as "scattered shrubs in deciduous and in mature forests on hills". In Kwangsi it is described by Ching as "a fairly common tree on cutover hillsides".

Watt (1889) says "Met with in Kumaon, Oudh, eastern Bengal, and Burma; chiefly in second-growth forests". He also reports that the bark is aromatic and bitter, and is applied in decoctions in the treatment of cutaneous diseases. He quotes a surgeon, W. Barren, who refers to it as "tonic, carminative". He notes that the wood polishes beautifully, but is not used by the natives except for making charcoal. Kurz (1877) calls it "Frequent in the upper mixed forests, entering the drier hill forests, of Martaban and Tenasserim; rather rare in Chittagong and Pegu; also Ava. Occurs also frequently in deserted hill toungyas up to 4,000 ft. elevation." Balfour (1885) calls it "a stout, tall tree of Nepal, Kamaon, Oudh, the Morung mountains, Goalpara, Chittagong, and Moulmein."

Moldenke (1963) reports that in Thailand it is found in deciduous mixed dipterocarp forests and in mixed evergreen forests at 100--500 meters altitude, and gives its general distribution as "India, Pakistan, Nepal, southern China, Indo-china, and Thailand to Malaya, the Philippines, Sumatra, Mantawi Islands, and New Guinea." I have, however, seen no material of the typical form of this species from the Philippines and feel now that all records previously published from the Philippines refer to var. psilocalyx (H. J. Lam) Moldenke.

Bhatnagar (1963) calls C. arborea a "rare evergreen tree" [most other writers refer to it as deciduous] in the Hollong Nahor (Dipterocarpus macrocarpus Vesque and Mesua ferrea L.) forests of Assam, in which there are 240 species in 59 families in the climactic formation occupying flat land and low broken hills with luxuriant vegetation. Ridley (1923) avers that it grows in "Woods in low country, not rare" in Malaya. He cites a Cantley collection from Negri Sembilan, a Wry collection from Perak, and a Curtis collection from Penang. He records it also from Kelantan.

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